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PUBLIC WORKS DEPARTMENT

(IRRIGATION),

FOR THE MONTH OF JULY 1900.

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

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Tenali Road Bridge.—The estimate of Rs. 7,300, for constructing the — over the Kopalli drain in the Kistna Western delta, sanctioned.	14th July, No. 596 I.	...	......
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River Embankment, Bank Canal, Góddávari Eastern Delta.—The estimates, amounting to Rs. 65,900 and Rs. 3,600, respectively, for the diversion of the — and of the Teki Side channel, sanctioned, and the estimate of Rs. 17,350, for the diversion of the Bank Canal, approved.	14th July, No. 598 I.	...	......
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Arkenkota Channel, Coimbatore District.—The estimate of Rs. 2,660 for resluicing the —, sanctioned.	20th July, No. 608 I.	...	......
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1 Subjects.	2 Numbers and Dates of Proceedings.	3 Date of Report to Secretary of State for India.	4 Numbers and Dates of previous Proceedings.
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Copy of the above Proceedings forwarded to the Government of India.	21st July, No. 614 I.	...	......
Kanigiri Reservoir, Penner river canals system.—The estimate, amounting to Rs. 64,300, for improvements to the —, approved, and a copy of the Proceedings ordered to be forwarded to the Government of India.	26th July, No. 621 I.	...	......
Forwarded	26th July, No. 622 I.	...	......
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IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd.	1900.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 572 I., 2nd July 1900.

JULY.

Funds

Certain transfers of — under 43. Minor Works and Navigation, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following paper :—

No. 138 I.

Note by the Chief Engineer for Irrigation.

With reference to G.O., No. 441 I., dated 9th May 1900, directing the adoption in the accounts of the current year of the amounts therein fixed as the old maintenance charges of the marginally-noted systems, the following transfers of funds are recommended for sanction :—

Vallur anicut.	Mehamattur anicut.
Cumbum tank.	Maradur "

Provincial.
Irrigation.
43. Minor Works and Navigation.

From

Class II.
Minor Works for which Capital and Revenue Accounts are kept.
Revenue Account.

	RS.	RS.
Kurnool Division. Cumbum Tank System.		
Maintenance and repairs ...	793	
Establishment	182	
Tools and plant	12	
		987
Chingleput Division. Vallur Anicut System.		
Extensions and improvements...	226	
Maintenance and repairs ...	1,077	
Establishment	299	
Tools and plant	19	
		1,621
South Arcot Division. Mehamattur Anicut System.		
Extensions and improvements	126	
Maintenance and repairs ...	510	
Establishment	146	
Tools and plant	10	
		792
Tinnevelly Division. Maradur Anicut System.		
Extensions and improvements...	200	
Maintenance and repairs ...	4,500	
Establishment	1,081	
Tools and plant	71	
		5,852
Total ...		9,252

To

Class IV.
Other Minor Works for which neither Capital nor Revenue nor individual Accounts are kept.
(*a*) In charge of P.W.D.
Old Maintenance Charges.

	RS.
Original works	552
Repairs	6,880
Establishment	1,708
Tools and plant	112
Total ...	9,252

25th June 1900.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

Order—No. 572 I., dated 2nd July 1900.

The transfers of funds recommended by the Chief Engineer for Irrigation are sanctioned.

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" the Examiner of Public Works Accounts.
" Superintending Engineers, III, V and VI Circles.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd. } 1900. *Enclosures*

Regd. *Spare copies*

G.O., Nos. 573, 574 I., 2nd July 1900.

JULY.

Periyar Project

Forwarding copy of Proceedings sanctioning the revised estimate of Rs. 7,250 for banking the Thandalay offtake through the Thandalay tank, 4th Branch channel, —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers:—

From the Superintending Engineer, VI Circle, dated 19th May 1900, No. 592 M.D.

No. 132 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, VI Circle, submits a revised estimate, amounting to Rs. 5,930, for banking Thandalay offtake through Thandalay tank, 4th Branch channel, Periyár project, involving an excess of Rs. 930 over the sanction accorded in G.O., No. 179 I., dated 20th February 1900. The excess is reported to be chiefly due to the provision in the original estimate for the left bank of the Thandalay branch and for forming a flood bank from the superpassage down to the surplus calingula in the Thandalay tank, having been found to be inadequate, and to the rate for banking having been increased as the spoil of which the bank is to be formed is found to be gravelly soil and not earth as originally anticipated. The revised estimate may be sanctioned.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

18th June 1900.

ORDER—No. 573 I., dated 2nd July 1900.

The following revised estimate is sanctioned, in supersession of the estimate of Rs. 6,100, sanctioned in G.O., No. 179 I., dated 20th February 1900:—

Capital Expenditure not charged to Revenue.
49. Irrigation.
Periyár Project.
Open Capital Account.
I. Works.
3. Distributaries.
4th Branch Channel.
Remunerative Work.
Banking the Thandalay Offtake through the Thandalay Tank.

	RS.	RS.
2 Land—		
(1) Compensation for land	230	
		230
3. Works—		
(2) Irrigation sluice	115	
(3) 2½ feet drop	285	
(4) Superpassage	1,800	
		2,200
4. Earthwork—		
(5) Excavating and banking	3,440	
		3,440

		RS.	RS.
5. Miscellaneous—			
(6) Demarcation stones		10	
(7) Demolishing the existing calingulas to the required level		50	
			60
Total,	I. Works		5,930
	II. Establishment ...		1,311
	III. Tools and plant ...		9
	Total, Estimate ...		7,250

2. This sanction is registered as No. 49 I. of 1900-1901 and will expire on the 31st March 1901.

3. Ordered that a copy of these proceedings be forwarded to the Government of India for information.

[Here enter No. 574 I., dated 2nd July 1900.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, VI Circle, with 21 enclosures.
" Examiner of Public Works Accounts.

ENDORSEMENT—No. 574 I., dated 2nd July 1900.

Forwarded.

(By order.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd.	1900.	*Enclosures*	
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G.O., Nos. 575, 576 I., 5th July 1900.

JULY.

Bank Canal, Godavari Delta System

Forwarding, for sanction, copy of Proceedings approving the estimate of Rupees 14,250 for the diversion of the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers:—

From J. P. DAVIDSON, Esq., A.M.I.C.E., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Waltair, 2nd May 1900, No. 1036 G.E.

I have the honour to submit for sanction, an estimate, amounting to Rs. 13,240, for the diversion of the Bank canal below Kowlaishweram lock, Gódávari Eastern division.

The report which accompanies the estimate explains the necessity for the work.

It will be seen from the survey plan that there are alternate lines; the adoption of the shorter line will mean a saving of Rs. 5,690; it will further mean that the existing arrangement of masonry will remain unaltered. My predecessor was in favour of the shorter line and it will be seen from paragraph 7 of the report that Mr. Mildred, who in the first instance favoured the longer line, is now completely in favour of the shorter one. The work should be put in hand without delay; and this must be my excuse for forwarding the estimate for the longer line, while recommending the shorter. I propose inspecting both lines in the course of next week, and would then finally decide which line should be adopted. Meanwhile, I would ask that, if you approve the proposal generally, that sanction to start work be communicated to me by wire, as time is of importance.

ENCLOSURE.

REPORT to accompany the estimate for diverting the Bank canal, miles 16 to 17—3.

1. Amount of the estimate—

	RS.
Long line	18,930
Short line	13,240

2. The percolation of the present Bank canal through the loose alluvial soil, composing the river margin having resulted in large slices of the margin slipping into the river and threatening the safety of the Gódávari left embankment, it has been decided to shift the canal to such a distance as to interpose a margin of sufficient width to prevent any further percolation.

3. At mile 16, furlongs 4–5 where the river margin has come dangerously close to the embankment, the new canal will be nearly 2 furlongs away from the river margin.

4. One of the alternative lines in its course crosses the Kondayya drain (a zemindari drain) and the Kowlaishweram No. II channel. The old canal was provided with a weir to relieve the canal during flood seasons and an under-tunnel to carry away the drainage of the village impounded between the canal right bank and the river embankment at this drain.

5. Since the construction of the Teki weir on the Coringa canal, it has rarely been found necessary to open the weir to relieve the canal; so it is now proposed to construct only an under-tunnel to drain the village site and the present canal leaving the Teki weir to do duty for both canals.

6. The Kowlaishweram No. II channel at present has its head in the Teki side channel just below the Teki head sluice at 17 miles and 4 furlongs and runs as a side channel up to 17 miles and 1 furlong, from whence it turns off to run parallel with the Kondayya drain. It is now proposed to construct a pipe sluice with screw-gearing in the new canal, where it intersects the channel at a cost of about Rs. 160 in preference to putting in a new side channel at a probable cost of Rs. 1,000 for land only.

7. The shorter line joins the canal again just above the Kondayya weir, and the cost is considerably less. On further consideration I strongly recommend this shorter line.

8. Permission is requested to proceed with the work as soon as arrangements can be made with the Revenue Department to get possession of the lands. It is essential that the diversion should be carried out this closure or a breach in the embankment is inevitable.

9. Provision has been made to demarcate the canal and the rates calculated to suit the locality.

(Signed) C. MILDRED,
Ex. Engr., Gódávari Eastern Divn.

From the Superintending Engineer, I Circle, dated 12th May 1900, No. 94 C.
Telegram to " " I " " 16th " "
" " " I " " 23rd " "
Telegram from " " I " " 31st " "
From the " " I " " 13th June " No. 1303 G.E.

No. 134 I.

Note by the Chief Engineer for Irrigation.

In a portion of the 17th mile of the Bank canal, Gódávari Eastern delta, the river margin which is formed of a mixture of black soil and sand which takes up water freely when the river is in flood, and slips when the river level drops, has come so close to the canal bank by the combined action of the river and the percolation of the canal water, that it is reported that the bank is distinctly in danger of breaching. The Superintending Engineer, I Circle, therefore proposes to divert the canal at this point, for which he submitted with the first of the papers read above two alternative estimates—one providing for a diversion at a cost of Rs. 18,930, and the other for a shorter diversion costing Rs. 13,240—the latter of which he recommends as it is cheaper, and entails the construction of no new masonry works. The estimate for the shorter diversion is recommended for sanction. In telegram, dated 16th May 1900, the Superintending Engineer was instructed to arrange for work.

2. The work is classed as "unremunerative" and will probably be completed by the 31st March 1901.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

19th June 1900.

ORDER—No. 575 I., dated 5th July 1900.

The following estimate is approved:—

Gódávari Delta System.
Eastern Section.
2. Main Canals and Branches.
Bank Canal.
Unremunerative work.
Diversion.

	RS.	RS.
2. Land—		
(1) Compensation for land	9,000	9,000
12. Earthwork—		
(2) Diversion of the canal	4,200	4,200
15. Miscellaneous—		
(3) Demarcation stones	40	40
Total, I. Works		13,240
II. Establishment ...		975
III. Tools and plant ...		35
Total estimate ...		14,250

2. The approximate original cost, viz., Rs. 5,500, of the portion of the Bank canal to be replaced by the proposed shorter diversion will, in due course, be written back by the Examiner of Public Works Accounts from the Capital to the Revenue account of the Gódávari delta system, in accordance with paragraph 37, Chapter V, Volume II, Public Works Department Code.

3. Ordered that a copy of these Proceedings be forwarded to the Government of India with a request that early sanction may be accorded to the estimate for the diversion under Open Capital Account of the Gódávari delta system—"49. Capital expenditure not charged to Revenue."

[Here enter No. 576 I., dated 5th July 1900.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle,
with twentytwo enclosures.
" Examiner of Public Works Accounts.

ENDORSEMENT—No. 576 I., dated 5th July 1900.

Forwarded.

(By order.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd.	} 1900.	*Enclosures*	
Regd.		*Spare copies*	

G.O., Nos. 577, 578 I., 5th July 1900.

JULY.

Major Productive Irrigation Works

Forwarding copy of Proceedings approving the programme drawn up by the Chief Engineer for Irrigation, showing the forecast of outlay during 1901–02 and 1902–03 on Class I—.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

G.O., No. 845 I., dated 6th October 1899.

From the	Superintending Engineer,	I Circle,	dated	19th Nov.	1899,	No.	1198 G.E.
,,	,,	,, II ,,	,,	25th ,,	,,	,,	10.
,,	,,	,, III ,,	,,	27th ,,	,,	,,	4286 I.
,,	,,	,, IV ,,	,,	7th ,,	,,	,,	292 I.
,,	,,	,, V ,,	,,	1st Dec.	,,	,,	419 E.I.
,,	,,	,, VI ,,	,,	14th Nov.	,,	,,	1950 T.C.
To the	Examiner of Public Works Accounts,		,,	15th Dec.	,,	,,	404.
From the	,,	,, ,,	,,	18th ,,	,,	,,	4162 B./B.
To the	Superintending Engineer,	V Circle,	,,	20th Jan.	,,	,,	V./1.
,,	,,	,, II ,,	,,	20th ,,	1900	,,	II./5 K.S.
From the	,,	,, V ,,	,,	21st Feb.	,,	,,	60 E.I.
,,	,,	,, II ,,	,,	29th Mar.	,,	,,	500 I.
To the	,,	,, II ,,	,,	3rd Apr.	,,	,,	II./41 K.S.
From the	,,	,, II ,,	,,	16th Apr.	,,	,,	15 I.

G.O., No. 433 I., dated 4th May 1900.

No. 133 I.

Note by the Chief Engineer for Irrigation.

With reference to paragraph 2 of Proceedings of Madras Government, No. 1034 I., dated 7th December 1899, the accompanying programme giving a forecast of outlay on Productive Irrigation works during 1901–1902 and 1902–1903 called for by the Government of India in its letter, No. 989 C.W.I., dated 25th September 1899, embodied in Proceedings of Madras Government, No. 845 I., dated 6th October 1899, is submitted to Government.

2. With regard to the current year's expenditure the amount shown in the programme exceeds the budget grant by Rs. 53,000.* This excess represents the additional grant of Rs. 1,00,000 reported by the Superintending Engineer, V Circle, to be required for expenditure on the work "Remodelling the Upper Coleroon anicut"† in the Cauvery delta system, *less* the sum of Rs. 47,000 lately transferred to that work from the current year's grant for the Penner river canals system—*vide* Proceedings of Madras Government, No. 535 I., dated 16th June 1900. In the programme submitted with his No. 419 E.I., dated 1st December 1899, the Superintending Engineer, V Circle, provided Rs. 1,53,100 for expenditure during the current year on improvements to drains in the Cauvery delta system, but as he has decided only lately what

* For works.

† Sanctioned in P.M.G., No. 500 I., dated 28th May 1897.

drains to estimate for, and it is believed that the estimates will not be in for some months, and therefore it is unlikely that they will be sanctioned in time for any work to be done this year, the proposed expenditure has been omitted. Rupees 2,00,000 have been provided in the programme on this account for each of the next two years. Provision has been made for the acquisition of land and purchase of plant next year for the Bhaváni project. The project has been generally approved by the Inspector-General of Irrigation and the apparent defects which he has noticed can, it is considered, be satisfactorily explained. When the estimates for the distributary works are revised in accordance with his suggestions, the project will be submitted for sanction.

3. In the case of the Kistna delta system the programme submitted by the Superintending Engineer, II Circle, with his No. 10, dated 25th November 1899, did not, as regards some of the works proposed to be carried out during the current year, agree with the schedule showing the distribution by component works of the current year's grant, submitted with his No. 20 I., dated 19th April 1900, for incorporation in the final issue of the budget estimate. The programme has been altered where necessary to agree with the budget. The expenditure proposed by the Superintending Engineer on the Penner river canals system has been increased by the amount of the estimate, viz., Rs. 53,000, for improving the Kanigiri reservoir divided between the next two years. The estimate for this work is under consideration and will shortly be submitted to Government.

4. In his programme the Superintending Engineer, VI Circle, proposed to spend the current year's grant of Rs. 50,000 ‡ for the Periyár project, on improvements to the maintained tanks for which estimates have not yet been sanctioned, and which he considers would cost Rs. 74,000; but the schedule showing the distribution by component works of the current year's grant submitted with his No. 744 T.C., dated 3rd May 1900, showed that the grant will be spent on sanctioned incomplete works. The programme has been prepared in accordance with the schedule referred to, and the proposed expenditure on improvements to tanks divided between the next two years as shown in the margin.

‡ For works.

	RS.
1901–1902	(a) 50,000
1902–1903	(a) 24,000

(a) For works.

5. In its letter quoted in paragraph 1 above the Government of India asked that the programme may be submitted with the schedule of demands on Imperial funds for expenditure during the current year on Class I—Major Productive and Protective works, which was forwarded with Proceedings of Madras Government, No. 1035 I., dated 7th December 1899. The delay in its submission was due to the programmes from the Superintending Engineers not having been received in time. The schedule referred to in paragraph 4 above was received from the Superintending Engineer, VI Circle, only on the 5th ultimo.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

14th June 1900.

ENCLOSURES.

FORM NO. 1.

PROPOSED Expenditure on (Sanctioned) Productive Irrigation Works for the three years ending 1902–1903 in the Madras Presidency.

Name of canal.	Sanctioned estimates (for works, the construction estimates of which have not been closed).	Direct Capital Outlay.			Balance to complete work.	Proposed expenditure during			Remarks.
		Actuals to end of 1898-99.	Probable during 1899-1900.	Total.		1900-1901, Grant.	1901-1902, Forecast.	1902-1903, Forecast.	
1	2	3	4	5	6	7	8	9	10
OPEN CAPITAL ACCOUNT.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	
GODAVARI DELTA SYSTEM.									
Central Section.									
Bank Canal.									
1. Constructing a combined drainage outfall sluice, aqueduct and canal surplus at 43¾ miles.	22,450	9,722	11,238	20,960	1,490	1,490	..	..	P.M.G., No. 879 I., dated 17th Oct. 1899.
2. Excavating Pasumilla main and branch channels and east and west side channels.	14,020	..	4,770	4,770	9,250	9,070	180	..	,, ,, 331 I., ,, 10th April ,,
Gunnaram Canal.									
3. Excavating Sivacodu side channel from left bank of the canal.	2,080	370	1,207	1,577	503	500	..	..	P.M.G., No. 109 I., dated 8th Feb. 1898.
4. Constructing an under-tunnel at 4 miles 6 furlongs and 538 feet of Kadali channel.	3,415	..	1,300	1,300	2,115	1,900	..	..	P.M.G., No. 251 I., dated 14th Mar. 1900 and P.M.G., No. 304 I., dated 26th Mar. 1900.
5. Excavating Billakurru drain	6,750	..	..	..	6,750	6,740	..	..	P.M.G., No. 729 I., dated 24th Aug. 1899.
Bandamurlanka Canal.									
6. Constructing an additional aqueduct at Allaram	27,800	..	..	..	27,800	20,000	7,800	..	P.M.G., No. 494 I., dated 30th May 1900.
Western Section.									
7. Excavating a short cut on the Yenamadurru drain to Naidupolliem.	86,300	2,650	24,000	26,050	60,250	25,000	35,250	..	P.M.G., No. 643 I., dated 24th Aug. 1898.
Total, Gódávari Delta System ..	1,62,815	12,142	42,515	54,657	1,08,158	64,700	43,230	..	
KISTNA DELTA SYSTEM.									
Eastern Section.									
Polraz Canal.									
8. Siding basin below Madanapalli bridge with wharf establishment sheds.	3,380	..	2,220	2,220	1,160	1,150	..	..	P.M.G., No. 927 I., dated 26th Oct. 1899.

Masulipatam Canal.									
9. Constructing an undertunnel at 5 furlongs of Gudapad branch of Meedur channel.	1,350	..	600	600	750	750	..	..	P.M.G., No. 731 I., dated 24th Aug. 1899.
Pulleru Canal.									
10. Excavating Tummacodu right side channel at 28 miles 2 furlongs of Peddalanka channel.	2,550	..	1,350	1,350	1,200	1,200	..	..	P.M.G., No. 822 I., dated 28th Sept. 1899.
11. Excavating Penjendra channel	4,920	..	..	..	4,920	4,920	..	..	,, ,, 983 I., ,, 20th Nov. ,,
Total ..	12,200	..	4,170	4,170	8,030	8,020	..	..	
Western Section.									
Bank Canal.									
12. Constructing a wharf at Vellatur 26 miles of Bank canal ..	4,240	..	2,000	2,000	2,240	2,240	..	..	P.M.G., No. 529 I., dated 26th June 1899.
13. Excavating Kollur side channel and its branches ..	26,030	..	12,300	12,300	18,730	9,675	4,055	..	,, ,, 513 I., ,, 22nd ,, ,,
14. ,, Royakampad affluent	9,560	..	7,600	7,600	1,960	1,960	..	..	,, ,, 197 I., ,, 24th Feb. ,,
15. ,, Bapatla tank east and west drains	5,110	..	3,800	3,800	1,310	333	977	..	,, ,, 278 I., ,, 18th Mar. ,,
Main Canal.									
16. Wharf establishment sheds at Seetanagaram	2,130	..	..	..	2,130	2,000	..	..	P.M.G., No. 467 I., dated 18th May 1900.
Nizampatam Canal.									
17. Wharf establishment shed at Tenali	2,090	..	..	..	2,090	250	1,950	..	Do. do.
Commamur Canal.									
18. Widening and improving the platform of Santaravur wharf at 47th mile.	3,550	..	3,000	3,000	550	550	..	..	P.M.G., No. 402 I., dated 5th May 1899.
19. Distributaries to Tungabhadra side channel with connected affluents.	54,000	..	..	..	54,000	20,000	18,820	15,180	,, ,, 292 I., ,, 21st Mar. 1900.
20. Wharf establishment sheds at Chebrole	2,310	..	..	..	2,310	..	2,310	..	,, ,, 467 I., ,, 18th May ,,
Total ..	1,09,020	..	28,700	28,700	80,820	37,008	28,112	15,180	
Total, Kistna Delta System ..	1,21,220	..	32,870	32,870	88,350	45,028	28,112	15,180	
Penner River Canals System.									
21. Nellore tank supply channel	2,12,100	..	19,985	19,985	1,92,115	28,000	1,00,000	64,115	Estimate sanctioned in P.M.G., No. 458 I., dated 28th May 1896. Of the current year's budget grant of Rs. 75,000 for this work, Rs. 47,000 were lately transferred to the Cauvery delta system—*vide* G.O., No. 535 I., dated 16th June 1900.
22. Muduverti drain	5,130	..	..	..	5,130	3,780	1,350	..	P.M.G., No. 19 I., dated 15th Jan. 1900.
23. Diverting the surplus of the Kanigiri reservoir into the Pyderu.	1,68,900	17,230	40,000	57,230	1,11,670	75,000	36,670	..	,, ,, 407 I., ,, 9th May 1896.
Total, Penner River Canals System ..	3,86,130	17,230	59,985	77,215	3,08,915	1,06,780	1,38,020	17,115	

Proposed Expenditure on (Sanctioned) Productive Irrigation Works for the three years ending 1902–1093 in the Madras Presidency—*cont.*

Name of canal.	Sanctioned estimates (for works the construction estimates of which have not been closed.)	Direct capital outlay.			Balance to complete work.	Proposed expenditure during			Remarks.
		Actuals to end of 1898–99.	Probable during 1899–1900.	Total.		1900–1901, Grant.	1901–1902, Forecast.	1902–1903, Forecast.	
1	2	3	4	5	6	7	8	9	10
Cauvery Delta System.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	
24. Remodelling the Upper Coleroon anicut	5,34,000	36,568	1,41,000	1,77,568	3,56,432	2,00,000	1,25,000	31,432	Estimate sanctioned in P.M.G., No. 500 I., dated 28th May 1897. The current year's budget grant for this work is Rs. 1,00,000; and a sum of Rs. 47,000 was lately transferred from the current year's grant for the Penner river canals system—*vide* G.O., No. 535 I., dated 16th June 1900; an additional grant to cover the balance of the amount required for expenditure on the work during the current year will be applied for later on.
25. Constructing a regulator and scouring sluice at the head of the Keerthimanar.	12,300	..	8,000	8,000	4,300	4,000	300	..	P.M.G., No. 514 I., dated 6th July 1898, and No. 715 I., dated 17th Sept. 1898.
26. Constructing Puthar-Solasudamaniar regulator.	17,300	..	8,000	8,000	9,300	6,000	1,300	..	P.M.G., No. 715 I., dated 17th Sept. 1898.
27. Constructing Puthar-Vellapar regulator	12,600	..	6,000	6,000	6,600	6,000	600	..	Do. do.
28. Conversion of the Cauvery-Kodamurty dam into a regulator.	1,00,000	..	60,000	60,000	40,000	30,000	10,000	..	P.M.G., No. 716 I., dated 17th Aug. 1899.
29. Improvements to the Arasalar-Nattar regulator	21,120	..	..	..	21,120	10,000	11,120	..	,, ,, 12 I., ,, 15th Jan. 1900.
30. Constructing the Cauvery-Veerasholan regulator ..	39,580	..	..	..	39,580	10,000	20,000	9,580	,, ,, 12 I., ,, 15th ,, ,,
31. Altering the Avur calingula across the Shullanar into an open dam with screw shutters.	2,790	..	..	..	2,790	2,700	90	..	,, ,, 454 I., ,, 12th May ,,
Total, Cauvery Delta System ..	7,39,690	36,568	2,23,000	2,59,568	4,80,122	2,68,700	1,68,410	41,012	
Periyar project.									
I. Reach.									
32. Peranai anicut—Improving and fitting falling shutters ..	5,000	..	1,786	1,786	3,214	6,000	..	..	P.M.G., No. 85 I., dated 25th Jan. 1900. Revised estimate is under preparation.
33. Constructing a bridge at 5 miles 1 furlong of the Periyar main canal.	2,320								
Contribution ..	— 1,160								
Balance ..	1,160	..	1,200	1,200	..	150	..	..	P.M.G., No. 836 I., dated 28th Oct. 1898. Revised estimate is under preparation.
XI. Reach.									
34. Constructing a sluice and distributary channel at 3 miles 6 furlongs and 100 feet.	5,850	..	3,611	3,611	2,239	2,239	..	..	P.M.G., No. 1104 I., dated 9th Dec. 1897.

1st Branch channel.									
35. Excavating a distributary and field channels from Thodaneri tank.	1,750	..	450	450	1,300	1,300	..	..	P.M.G., No. 876 I., dated 18th Nov. 1898.
3rd Branch channel.									
36. Constructing cross drainage works	2,430	..	2,333	2,333	97	97	..	..	P.M.G., No. 842 I., dated 20th Sept. 1897.
37. Excavating distributary and field channels from head sluice in Athalay tank.	1,200	..	333	333	867	867	..	..	,, ,, 539 I., ,, 26th June 1899.
4th Branch channel.									
38. Distributary channel from the tail-end of 4th Branch channel to Kovilpapagudi tank.	2,640	..	2,796	2,796	..	500	..	..	P.M.G., No. 501 I., dated 30th June 1898. Revised estimate is under preparation.
39. Excavating the extension of the tail-end of Thiruppalai offtake	4,420	..	4,028	4,028	392	392	..	..	P.M.G., No. 284 I., dated 18th Mar. 1899.
40. Regulating the 4th branch channel and Thandalay offtake..	1,050	..	792	792	258	258	..	..	,, ,, 630 I., ,, 24th July ,,
41. Banking Thandalay offtake through Thandalay tank.	5,000	..	5,047	5,047	..	300	..	..	,, ,, 179 I., ,, 20th Feb. ,, Revised estimate is reported to be under scrutiny.
42. Excavating field channel from sluice No. 2 in Boothagudy tank, Thandalay offtake.	1,310	..	422	422	888	888	..	..	P.M.G., No. 946 I., dated 3rd Nov. 1899.
9th Branch channel.									
Chittamputy Offtake.									
43. Improvements to Thirukkanam tank	1,260	..	1,159	1,159	101	101	..	..	P.M.G., No. 561 I., dated 22nd July 1898.
Kunnathore Offtake.									
44. Constructing a 2-ft. drop at 3 miles 1 furlong and raising banks above the same and constructing sluices and excavating field channels in Kunnathore offtake.	2,450	..	535	535	1,915	1,915	..	..	P.M.G., No. 721 I., dated 18th Aug. 1899.
Papagudi Offtake.									
45. Excavating the tail end of Papagudi offtake and constructing masonry works in the same.	8,790	..	7,284	7,284	1,506	1,506	..	..	P.M.G., No. 586 I., dated 29th July 1898.
10th Branch channel.									
46. Excavating a distributary channel from the left bank of 10th branch channel to Arittaputty tank.	2,310	..	1,507	1,507	803	803	..	..	P.M.G., No. 563 I., dated 22nd July 1898.
Chunambur Offtake.									
47. Excavating a distributary channel to take off from the Chunambur offtake at 6 miles 4 furlongs and 80 feet.	7,185	..	4,316	4,316	2,869	2,869	..	..	P.M.G., No. 188 I., dated 22nd Feb. 1899.
48. Improving the Chunambur offtake from drop No. 2 to drop No. 3.	2,810	..	160	160	2,650	2,650	..	..	,, ,, 917 I., ,, 25th Oct. ,,
11th Branch channel.									
49. Excavation	24,630	..	23,288	23,288	1,342	1,342	..	..	P.M.G., No. 406 I., dated 28th April 1897.
50. Excavating field channels	3,185	..	926	926	2,259	2,259	..	..	,, ,, 921 I., ,, 25th Oct. 1899.

Proposed expenditure on (sanctioned) Productive Irrigation Works for the three years ending 1902–1903 in the Madras Presidency—*cont.*

Name of canal.	Sanctioned estimates for works the construction estimates of which have not been closed).	Direct capital outlay.			Balance to complete work	Proposed expenditure during			Remarks.
		Actuals to end of 1898–99.	Probable during 1899–1900.	Total.		1900–1901, grant.	1901–1902, forecast.	1902–1903, forecast.	
1	2	3	4	5	6	7	8	9	10
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	
12th Branch channel.									
51. No. 4 distributary from the right sluice of drop No. 6 at 2 miles 140 feet.	5,070	..	4,328	4,328	742	742	..	..	P.M.G., No. 361 I., dated 13th April 1899.
52. No. 7 distributary from proposed head sluice at 5 miles 4,100 feet.	3,220	..	3,703	3,703	..	200	..	..	P.M.G., No. 361 I., dated 13th April 1899. Revised estimate is under scrutiny.
53. Excavating the VI-A. distributary	7,300	..	5,578	5,578	1,722	1,722	..	..	P.M.G., No. 1141 I., dated 22nd Dec. 1897.
54. Do. VI-B. do.	910	..	529	529	381	381	..	..	Do. do.
55. Do. VI-C. do.	4,480	..	3,177	3,177	1,303	1,303	..	..	Do. do.
56. Do. VI-D. do.	1,431	..	599	599	832	832	..	..	Do. do.
57. Do. VI-E. do.	1,479	..	301	301	1,178	1,178	..	..	Do. do.
58. Excavating a sub-distributary from the 9th distributary, 12th Branch channel.	3,530	..	740	740	2,790	2,790	..	..	P.M.G., No. 299 I., dated 24th March 1899.
59. Excavating the 9th distributary channel taking off at the 8th mile on the right bank of the 12th Branch channel, and constructing its masonry works.	20,000	..	16,863	16,863	3,137	3,137	..	..	P.M.G., No. 900 I., dated 9th October 1897.
60. Excavating XI and XI-A distributaries from 10th mile, 12th Branch channel.	8,780	..	7,047	7,047	1,733	1,733	..	..	P.M.G., No. 586 I., dated 29th July 1898.
61. Excavating minor distributaries and field channels in the first 9 miles of the 12th Branch channel.	3,600	..	901	901	2,699	2,699	..	..	P.M.G., No. 367 I., dated 20th April 1899.
62. Excavating field channels and constructing pipe and masonry sluices &c., in the 12th Branch channel, below the 9th mile.	3,480	..	27	27	3,453	1,000	2,453	..	P.M.G., No. 302 I., dated 26th March 1899.
Total, Periyár Project ..	1,47,710	..	1,05,586	1,05,586	42,670	44,153	2,453	..	
Total, Works ..	15,57,565	65,940	4,63,956	5,29,896	10,28,215	5,29,361	3,80,225	73,307	
Establishment ..	..	..	..	..	..	1,16,851	87,451	16,860	
Tools and Plant ..	..	..	..	..	..	788	324	833	
Grand Total ..	..	..	..	..	..	6,47,000	4,68,000	91,000	

NOTE.—The probable capital outlay on the Kurnool-Cuddapah canal which is met from "Provincial—43. Minor Works and Navigation" has not been included in this statement.

FORM NO. II.

Proposed expenditure on Productive Irrigation Works for which estimates of cost have not been sanctioned for the three years ending 1902–1903.

Name of canal.	Name of work.	Probable cost of work.	Proposed expenditure. 1900–1901.	1901–1902.	1902–1903.	Remarks.
1	2	3	4	5	6	7
Godavari Delta System. *Central Section.*		RS.	RS.	RS.	RS.	
Main canal ..	1. Excavating a channel from 5 miles 2 furlongs, right bank of canal for irrigating lands between Gunnaram and Mari canal and Vasista right bank.	10,000	..	..	5,000	The Superintending Engineer states that the line has been selected and some levels taken. A second crop channel, chiefly, will, it is said, be worked out.
	2. Excavating a channel from main canal left bank to irrigate lands between Bank canal and Gowtami right bank.	10,000	..	..	5,000	Line marked out and not levelled.
Bank canal ..	3. Excavating Rajupalem channel, branch of Javelanka channel, to irrigate lands between Mamidivaram and Vriddha-Gowtami drain.	10,000	..	7,000	3,000	Project nearly worked out. Estimate will, it is said, be submitted shortly. Figures only approximate.
	4. Excavating side channel, Bank canal from Javelanka to Annampalli to do away with low spouts.	6,000	..	4,000	2,000	The Superintending Engineer reports that this is a very necessary work. Line settled.
	5. Excavating parallel channel from above Chintallanka lock to irrigate lands between Bank canal and Vriddha-Gowtami drain.	10,000	..	5,000	5,000	The Superintending Engineer reports that the line has not yet been selected. Tracing of country has been prepared and the scheme is being worked out.
	6. Excavating branch channel from Vilasa channel to irrigate lands in Magam and Vemavaram, &c.	8,000	..	3,000	5,000	The Superintending Engineer reports that the tracing has been prepared, line selected, and that levels, etc., remain to be taken.
	7. New head to Vilasa channel, the present head sluice to be used for No. 5 above.	1,200	..	500	700	Estimate will be prepared when that for item 5 is worked up.
	8. Excavating a channel from above Wadapalem lock carried by a syphon to the left side of Billakurru channel to irrigate about 1,000 acres.	12,000	..	..	5,000	The Superintending Engineer reports that the proposed line has not yet been selected and that the project may be worked up.
Gunnaram canal ..	9. Excavating Gadimellanka channel	1,114	1,114	..	..	It is reported that the estimate is awaited. This is a small channel in the 4th reach. Gunnaram canal, proposed to do away with low spouts which waste water.
Western Section. Narsapur canal ..	10. Narasapur under-tunnel and drainage scheme	20,000	10,000	10,000	..	The Superintending Engineer states that plans and estimates are awaited.
	Total, Gódávari Delta System ..	88,314	11,114	29,500	30,700	
Kistna Delta System. *Eastern Section.*	Works included in the construction estimate —					
Ellore canal ..	11. Madapalle channel cattle crossing	394	394	..	..	The report on the closure of the construction estimate of the system and the schedule of works prescribed in paragraph 35, Chapter V, Volume II, Public Works Code, are still awaited from the Superintending Engineer to whom several reminders have been sent. The balances required to complete the works have been taken to be the probable cost of the works.
	12. Gogunta channel drop No. 2	107	107	..	..	
	13. ,, ,, No. 3	293	293	..	..	
	14. ,, ,, No. 4	361	361	..	..	

Proposed expenditure on Productive Irrigation Works for which estimates of cost have not been sanctioned for the three years ending 1902–1903—*cont.*

Name of canal.	Name of work.	Probable cost of work.	Proposed expenditure. 1900–1901.	1901–1902.	1902–1903.	Remarks.
1	2	3	4	5	6	7
KISTNA DELTA SYSTEM—*cont.*		RS.	RS.	RS.	RS.	
Eastern Section—cont.	Works included in the construction estimate—*cont.*					
Ryves' canal ..	15. Kunderu channel, cattle ramp at Kattur	197	197	..	..	
	Drainage works—					
	16. Excavating Vinnacottacodu drain	627	627	..	..	
	17. ,, Yedavalli drain	300	300	..	..	
	18. Minor drains in Pedalanka project	3,000	1,000	1,000	1,000	
	19. Drop at head of Pedapadu escape drain	166	166	..	..	
	20. Excavating Vutukur affluent	1,000	1,000	..	..	
	21. ,, Amudapalli affluent	1,000	1,000	..	..	The report on the closure of the construction estimate of the system and the schedule of works prescribed in paragraph 35, Chapter V, Volume II, Public Works Code, are still awaited from the Superintending Engineer to whom several reminders have been sent. The balances required to complete the works have been taken to be the probable cost of the works.
	22. Bench mark stones for Vutukur affluent	77	77	..	..	
	23. Excavating Kudaravalli drain	342	342	..	..	
	24. Demarcation stones for Kudaravalli drain	48	48	..	..	
Masulipatam canal ..	25. Surplus weir at 22 miles	1,000	1,000	..	..	
Pulleru canal	26. Sluice to Marrivada left bank at 5 miles 150 feet of Mamilla-codu.	90	90	..	..	
	Total ..	9,002	7,002	1,000	1,000	
Western Section.						
Bank canal	27. Excavating the proposed straight cut on Repalli main drain.	903	1,000	..	..	
Commamur canal ..	28. Excavating the Perali drain	8,796	9,900	..	..	
	29. Constructing regulators for Aramanda and Alavada channels at 11 miles 7 furlongs of Tungabhadra side channel.	790	800	..	..	
	30. Compensation for land for Tungabhadra side channel ..	7,700	..	4,000	3,700	
	31. Demarcation stones for Tungabhadra side channel ..	437	437	..	..	
	32. Compensation for land for Alleru affluent	201	..	201	..	
	Total ..	18,827	12,137	4,201	3,700	
Eastern Section.						
Masulipatam canal ..	33. Purchasing Messrs. Napier Brother's Bungalow for the Kistna Western Division officer.	16,000	16,000	..	..	
	34. Iron bridges in place of ramps on the Bheemanadi channel..	4,685	2,000	2,685	..	The Superintending Engineer states that the estimate received from the Sub-Divisional officer had to be returned for revision in a more complete form.
	35. Improvements to west side channel	4,380	3,000	1,380	..	The Superintending Engineer states that plans are in his office and will be checked and submitted shortly.
	36. Inampoody channel	1,915	1,915	..	..	It is reported that the estimate has been returned to the Southern Sub-Divisional officer for further information.

Ellore canal ..	37. Constructing wharf wall at Ellore	8,820	5,063	3,757	..	The Superintending Engineer states that the estimate has been returned for revision.
	38. Improvements to West Tamileru escape	3,930	2,000	1,930	..	It is reported that an estimate is under check, and that proposals will be made for special shutters.
Pulleru canal ..	39. Excavating Bhogeswaram channel	3,320	..	1,500	1,820	It is reported that the estimate will be taken up when the investigation as to the sufficiency of water-supply is completed.
	40. Improvements to Nadimi codu	3,120	2,500	620	..	The Superintending Engineer states that the estimate has been returned for further explanation.
Polraz canal	41. Excavating Kallicodu drain	2,375	2,000	375	..	The estimate is reported to be under check.
Ryves' canal	42. Indupalli channel	..	..	..	3,000	It is reported that the estimates have been prepared, but work postponed, it being doubtful if the work is advisable. The question is one of water-supply. If the special investigation now in progress is favourable, the work may be carried out.
	Total ..	48,545	34,478	12,247	4,820	
Western Section.						
Main canal	43. Improvements to east side channel and its branches ..	15,000	3,000	6,000	6,000	Levels taken. Plans and estimates for masonry works have partly been prepared. Estimates for earthwork and land compensation have to be prepared.
Bank canal ..	44. Improvements to Kollipara channel	10,000	3,000	3,000	4,000	Levels for seven miles of main channel taken and those for the remaining lengths and block levels for the branch channels have to be taken and lines selected.
	45. Compensation for land for Vellatur side channel	24,000	3,500	10,500	10,000	Estimates have, it is said, been received in the Superintending Engineer's office.
	46. Masonry works on Vellatur channel	22,890	9,307	7,583	6,000	
	47. Excavating Vellatur channel	26,600	10,000	12,500	4,100	
	48. Cattle crossings and demarcation stones on Vellatur channel.	5,460	2,000	2,000	1,460	
	49. Excavating the branches of Vellatur channel	1,53,470	10,000	10,000	10,000	
	50. Cattle crossings on the Bank canal	5,000	..	..	5,000	Plans and estimates have to be prepared.
	51. ,, on Repalli main drain straight cut ..	3,000	..	1,500	1,500	
Commamur canal ..	52. Cattle crossings at Chintagumpala	2,000	..	1,000	1,000	Sections for preparing plans have, it is said, been called for.
	53. Head sluice to Poondla channel	2,020	1,000	1,020	..	The estimate received from the Superintending Engineer, II Circle, will be considered along with that for the proposed Appapuram channel which has been returned to him for revision.
	54. Under tunnel at 2 miles 2 furlongs of Poondla channel ..	3,420	1,000	2,420	..	
	55. Excavating the Poondla channel	4,420	1,000	3,420	..	
	56. Head sluice to Poondla large tank bed channel	680	300	380	..	
	57. ,, ,, ,, supply channel ..	670	300	370	..	
	58. Tail dam to Poondla large tank supply channel	680	300	380	..	
	59. Cattle crossings to Poondla large tank supply channel ..	800	400	400	..	
	60. Demarcation stones to Poondla large tank supply channel..	390	390	..	..	
	61. Head sluice to Ramanappa channel of Poondla channel ..	730	400	330	..	
	62. Head sluice to Appicutta channel of Poondla channel ..	650	350	300	..	
	63. Compensation for land for Poondla channel	800	..	800	..	
	64. ,, ,, for Appapuram channel	13,300	..	10,000	3,300	
	65. Masonry works on Appapuram channel	66,010	5,757	30,000	30,253	Estimate received from the Superintending Engineer has been returned to him for revision.
	66. Excavating Appapuram channel	37,330	10,000	20,000	7,330	
	67. ,, branch channels to Appapuram channel ..	17,140	..	10,000	7,140	
	68. Appapuram channel—cattle crossings and demarcation stones.	2,020	..	2,020	..	

Proposed expenditure on Productive Irrigation Works for which estimates of cost have not been sanctioned for the three years ending 1902–1903—*cont.*

Name of canal.	Name of work.	Probable cost of work.	Proposed expenditure. 1900–1901.	1901–1902.	1902–1903.	Remarks.
1	2	3	4	5	6	7
Western Section—cont.		RS.	RS.	RS.	RS.	
Commamur Canal—*cont.*	69. Road bridge over Kopalli drain across Tenali road ..	5,870	3,000	2,870	..	The Superintending Engineer reports that the estimate is nearly ready.
	70. Compensation for land for Poondla drain	800	..	800	..	*Vide* remarks against items 53 to 63.
	71. Excavating Poondla drain	17,300	5,000	10,000	2,300	
	72. Demarcation stones for Poondla drain	400	400	..	..	
	73. Cattle crossings for Poondla drain	1,200	1,200	..	..	
	74. Constructing an iron girder bridge on coast road in Perali drain.	20,000	4,390	7,610	8,000	A lump sum of Rs. 20,000 was provided for this work in the construction estimate of the Kistna delta system. Plan and estimate are under preparation.
	75. Doppalapudi drain	10,000	..	5,000	5,000	Revised line for the drain has yet to be selected.
	76. Cattle crossings on Romperu drain	3,000	..	2,000	1,000	It is reported that the estimate has been received from the Sub-divisional officer and will be taken up for check shortly.
	Total ..	4,77,050	75,994	1,64,203	1,13,383	
	Total, Kistna Delta System ..	5,53,424	1,29,611	1,81,651	1,22,903	
Penner River Canal System.	77. Improvements to Kanigiri reservoir	53,000	..	27,000	26,000	The estimate submitted by the Superintending Engineer, II Circle, is under consideration and will shortly be submitted to Government.
Kanigiri canal	78. Talamanchi channel	10,000	..	5,000	5,000	The line has been selected, levels taken and plans prepared. Estimates are under preparation. Figures approximate.
Kistnapatam canal ..	79. Drainage of lands between Kistnapatam canal and Valluru channel.	8,000	..	3,000	3,000	The lines have been selected and levels are being taken for the drainage and other channels; plan and estimate for an under-tunnel ready. Figures approximate.
	Total, Penner River Canals System ..	..	..	35,000	34,000	
Cauvery Delta System	80. Improvements to Pamaniyar-Edachimulai dam	6,400	3,400	3,000	..	Estimates are reported to be under check.
	81. Improvements to Pamaniyar-Peruvelandan dam	6,500	3,500	3,000	..	
	82. Improvements to Pamaniyar-Agamalanar dam	6,300	3,300	3,000	..	
	83. Improvements to Mullayar-Pundaveli dam	6,100	3,100	3,000	..	
	84. Constructing Pamaniyar bridge on Road No. 18	19,000	10,000	5,000	4,000	
	85. Improvements to Mullayar-Adappar dam	6,270	3,122	3,148	..	The estimate received from the Superintending Engineer has been returned to him for revision.
	86. Improving drains	..	..	2,00,000	2,00,000	Estimate is under preparation.
	Total, Cauvery Delta System ..	50,570	26,422	2,20,148	2,04,000	

Bhavani Project.	87. Bhavâni project—					
	Works and land	86,11,000	..	* 3,30,000	† 6,00,000	The estimate is under consideration.
	Tools and plant	4,08,105	..	1,50,500	50,000	
	Total, Bhavâni Project ..	90,19,105	..	4,80,500	6,50,000	
Srivaikuntam Aniout System.	88. Improvements to Athur tank	9,000	4,878	4,122	..	The estimate received from the Superintending Engineer, VI Circle, is under consideration and will shortly be submitted to Government.
	Total, Srivaikuntam Aniout System ..	..	4,878	4,122	..	
Periyar Project ..	89. Fixing enamelled iron gauges in the Periyar main canal ..	523	523	..	..	These works will be included in the schedule prescribed in paragraph 35, Chapter V, Volume II, Public Works Department Code, which will be submitted to Government on receipt of the revised forecast of revenue expected to be derived from the project called for from the Board of Revenue.
	90. Do. do. do. ..	903	903	..	..	
	91. Distributary No. 1 at 0 mile 4,700 feet of 12th Branch channel, estimate Rs. 2,080.	420	420	..	..	
	Kunnathore offtake—					
	92. Excavating a distributary from the right sluice at drop No. 1 of Kunnathore offtake, estimate Rs. 4,180.	450	450	..	..	The revised estimate for this work which was approved in P.M.G., No. 369 I., dated 20th April 1899, will be included in the schedule of incomplete works of the project which will be submitted to Government on receipt of the revised forecast of revenue called for from the Board of Revenue.
	8th Branch channel—					
	93. Excavating the tail end	3,950	873	3,050	..	Estimate is under preparation.
	94. Constructing sluices and excavating field channels in Chunambur offtake.	2,915	2,454	241	..	The Superintending Engineer states that the estimate received from the Executive Engineer is under scrutiny.
	95. Improvements to the maintained tanks	74,000	..	50,000	24,000	
	96. Distributary No. 2 at 1 mile 1,620 feet, 12th Branch channel.	280	224	..	..	*Vide* remarks against items 89 to 91.
	Total, Periyâr Poject ..	83,441	5,847	53,291	24,000	
	Total, Works	..	1,77,872	8,53,712	10,15,603	
	Establishment ..	..	40,105	1,48,904	2,29,678	
	Tools and plant ..	..	23	1,51,384	50,719	
	Grand Total ..	..	2,18,000	11,54,000	12,96,000	

* Of this Rs. 1,80,900 is for land.

† This sum is for works only.

Note.—The probable capital outlay on the Kurnool-Cuddapah canal which is met from "Provincial 43. Minor Works and Navigation" has not been included in this statement.

ORDER—No. 577 I., dated 5th July 1900.

The programme showing the forecast of outlay during 1901-02 and 1902-03 on Class I—Major Productive Irrigation Works, as drawn up by the Chief Engineer for Irrigation, is approved, and will be forwarded to the Government of India with reference to its letter No. 989 C.W.I., dated 25th September 1899.

[Here enter No. 578 I., dated 5th July 1900.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" all Superintending Engineers.
" the Examiner of Public Works Accounts.

ENDORSEMENT—No. 578 I., dated 5th July 1900.

Forwarded.

(By order.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd. } 1900. *Enclosures*

Regd. *Spare copies*

G.O., No. 581 I., 6th July 1900.

JULY.

Avadhanula Tank

The estimate of Rs. 2,880, for excavating a channel from the new head sluice in the — under the Purushotapuram channel, Ganjám Minor Rivers system, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From J. P. DAVIDSON, Esq., A.M.I.C.E., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Waltair, 18th May 1900, No. 482 G.N.

I have the honour to submit, herewith, for your approval and sanction of Government, plans and estimates amounting in all to Rs. 2,535 for the excavation of a channel from the new head sluice in the Avadhanula tank of Purushotapuram, item No. 15, under Purushotapuram channel, Ganjám Minor Rivers system.

2. Provision is made in the estimate for compensation to the extent of Rs. 1,070 for lands to be taken up.

The necessity for the work is explained in the report. It will be noticed from the survey plan that the new channel for some distance follows very closely the line of the old channel; the question whether it would not be possible to utilize the old channel for the distance the old and new channels follow a parallel course, has been fully considered and the decision is that a new channel from the head sluice onwards is necessary.

3. Briefly it is the old story of high level lands and low level lands under the same channel, and as the high level lands lie at the upper end of the existing channel, the low level lands which are twice as extensive, viz., 1,000 acres against 500, get a very precarious supply; absolute separation of the means of supply to the lands in question is the only certain method of ensuring a proper supply to the 1,000 acres of low-lying lands.

4. The new head sluice referred to in paragraph 1 of the report for which an estimate of Rs. 1,300 was sanctioned by my predecessor in March last is intended to replace the existing ruined sluice in the Avadhanula tank. The new channel will supply both the existing Nairi channel and the new channel for which these estimates are submitted.

Enclosure.

Report to accompany the estimate for excavating a new channel from the new sluice of the Avadhanula tank of Purushotapuram, item No. 15, Purushotapuram channel system.

	RS.
Amount of estimate	2,535

An estimate for constructing a new head sluice * in the Avadhanula tank of Purushotapuram has been already submitted for sanction, and as noted in the report accompanying the above, proposals have been matured for improving the details of water-distribution therefrom.

The new channel for which this estimate is submitted, is intended for the irrigation of 540 acres of high land of Purushotapuram village which are now irrigated by the adjacent old channel † by means of eight cross bunds.

This old channel is over 5 miles long and at present, in addition to this 540 acres, irrigates over 1,000 acres of Government land of Ponnam near its end. The supply to this large area is constantly cut off by these cross bunds which are a mamul of the Purushotapuram ryots. The

* Sanctioned (*vide* Superintending Engineer's No. 196 G.N., dated 1st March 1900) for Rs. 1,300.

† Naira branch, item No. 16.

bed of the old channel has a fall, near its head, of 6 feet per mile and is consequently much scoured and hence the necessity for the bunds. The old channel will be improved later on and some masonry works built in it and it will be reserved exclusively for the 1,000 acres of land referred to, the high level land of Purushotapuram being separately provided for by the new channel. This work will be carried out as per standard specifications and completed by December 1901.

11th March 1900. (Signed) J. M. M.PARKER,
Ex. Engineer, Ganjám Divn.

No. 139 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, I Circle, submits the accompanying estimate, amounting to Rs. 2,535, for excavating a channel from the new head sluice in the Avadhanula tank, under the Purushotapuram channel, Ganjám Minor Rivers system, for the irrigation of 540 acres of high level lands lying at the upper end of the Naira channel, and supplied therefrom by means of eight cross bunds. It is reported that the existing Naira channel irrigates, besides the 540 acres referred to, an extent of 1,000 acres of low level lands near its end which gets a very precarious supply on account of the cross bunds, and that the only way of ensuring a proper supply to it is by excavating the proposed channel, and reserving the old channel exclusively for the 1,000 acres. The estimate may be sanctioned.

2. The estimate of Rs. 1,300 for the new head sluice in the Avadhanula tank being beyond the Superintending Engineer's powers of sanction, he will be instructed to submit it for the sanction of Government.

(Signed) W. HUGHES,
25th June 1900. Chief Engineer for Irrigation.

Order—No. 581 I., dated 6th July 1900.

The following estimate is sanctioned:—

Provincial.
Irrigation.
43. Minor Works and Navigation.
Class II—Minor Works and Navigation for which Capital and Revenue Accounts are kept.
Ganjám Minor Rivers System.
Open Capital Account.
(3) Distributaries.
Excavating a channel from the new head sluice in the Avadhanula tank, under the Purushotapuram channel.

	RS.	RS.
2. Land—		
(1) Compensation for land	1,070	1,070
3. Works—		
(2) Constructing drop	105	105
4. Earthwork—		
(3) Excavation	1,290	1,290
5. Miscellaneous—		
(4) Demarcation stones	70	70
Total, I. Works		2,535
II. Establishment		337
III. Tools and plant		8
Total, Estimate ...		2,880

2. This sanction is registered as No. 50 I. of 1900-1901 and will expire on the 31st March 1901.

3. The attention of the Superintending Engineer, I Circle, is drawn to paragraph 2 of the foregoing note by the Chief Engineer for Irrigation.

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle, with fifteen enclosures.
" Examiner of Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd.	1900.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 586 I., 9th July 1900.

JULY.

Shed

The estimate of Rs. 400, for constructing a lascar's — at the head of the Dusi channel, Ganjám Minor Rivers system, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From J. P. DAVIDSON, Esq., Superintending Engineer, I Circle, to the Chief Engineer for Irrigation, dated Waltair, 15th June 1900, No. 546 G.N.

I have the honour to submit herewith, for the sanction of Government, an abstract estimate, amounting to Rs. 400, for constructing a lascar's shed at the head of Dusi channel of Ganjám Minor Rivers system.

2. The necessity of the work is explained in the report accompanying the estimate.

Enclosure.

Report to accompany the estimate for constructing a lascar's shed at the head of Dusi channel.

	RS.
Amount of estimate	340

Lascars' sheds have been built at the heads of all channels—*vide* G.O., No. 793 I., dated 20th December 1887, and Superintending Engineer's Nos. 595 G.N., dated 27th August 1896, and 876 G.N., dated 29th December 1896. In the case of the Dusi channel, however, none has been built up to date, because there was no head sluice. A head sluice, however, has been sanctioned, and is being built now, and consequently, the present estimate for a lascar's shed exactly similar in plan to those sanctioned in the above Government Orders, etc., is herewith submitted for sanction. No fresh plan or detail estimate is therefore submitted herewith, but only an abstract estimate with the necessary data sheet.

The work will be carried out as per standard specifications and completed by the end of the year.

22nd March 1900.

(Signed) J. M. PARKER,
Ex. Engineer, Ganjám Divn.

No. 141 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, I Circle, submits an estimate, amounting to Rs. 400, for constructing a shed at the head of the Dusi channel, Ganjám Minor Rivers system, for the use of the lascar appointed for the distribution of water. A head sluice to the channel was sanctioned in G.O., No. 931 I., dated 26th October 1899, and is under construction. The estimate may be sanctioned.

27th June 1900.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

ORDER—No. 586 I., dated 9th July 1900.

The following estimate is sanctioned :—

Provincial.
Irrigation.
43. Minor Works and Navigation.
Class II—Minor Works and Navigation for which Capital and Revenue Accounts are kept.
Ganjám Minor Rivers System.
Revenue Account.
I. Extensions and Improvements.
2. Main Canals and Branches.
10. Buildings.
Constructing a lascar's shed at the head of the Dusi channel.

	RS.
Estimate	400

2. This sanction is registered as No. 51 I. of 1900-1901.

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, I Circle, with three enclosures.
„ Examiner of Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd.	1900.	*Enclosures*
Regd.		*Spare copies*

G.O., Nos. 590, 591 I., 10th July 1900.

JULY.

Nakkala Codu, Kistna Delta System

Forwarding copy of Proceedings sanctioning the estimate of Rs. 1,860 for extending the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers:—

From J. HANNAN, Esq., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 1st June 1900, No. 61 I.

I have the honour to forward, herewith, plan and estimates, amounting to Rs. 1,570, for extending Nakkala codu branch of Gudiváda channel of Pulleru, in the Kistna Eastern division, and to request that you will be so good as to obtain the sanction of Government to the same under "Open Capital Account."

2. The report which accompanies the estimate explains the necessity for the work.

ENCLOSURES.

REPORT to accompany the estimate for extending Nakkala codu.

	RS.
Estimate	1,570

Nakkala codu, a branch of Gudiváda channel, stops at about a furlong below Gudiváda to Buntumilly road. Beyond this, the lands between Chintala codu and Gudiváda channel are intended to be supplied by Chintala codu. But Chintala codu having a large area under it, and the F.S.L. throughout the channel not being sufficiently high above the lands, turns are arranged along it, the lands on the right side of the channel do not get a proper supply and in consequence the ryots get only a precarious crop.

These lands can be better supplied by extending Nakkala codu for a length of about a mile as the F.S.L. in it is much above the ground level; this extension will partly relieve the difficulty of deficient supply under Chintala codu and the present estimate is to carry out this extension along an existing donka, which for half its length is broad enough to take a channel throughout, and to set apart required space on one side for a cattle path; where the donka at the latter part of the extension of the channel is not sufficiently broad land will be taken for the channel and excavating side pits.

Estimate Form—Abstract—Classified.

Sub-head.	Names of works.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.
1	2	3	4	5	6
	CAPITAL EXPENDITURE NOT CHARGED TO REVENUE.	RS.	RS.	RS.	
	49. IRRIGATION.				
	Kistna Delta System.				
	Eastern Section.				
	Open Capital Account.				
	3. Distributaries.				
	Pulleru canal.				
	Remunerative work.				
	Extending Nakkala codu, branch of Gudiváda channel.				
2. Land ..	Compensation	323	323		
4. Earthwork ..	Excavation	1,197	1,197		
5. Miscellaneous.	Demarcation stones	50	50		
	Total, I. Works	..	..	1,570	
	II. Establishment ..	..	..	287	
	III. Tools and plant ..	..	..	3	
	Total Estimate ..	..	..	1,860	

14th April 1900.

(Signed) J. S. WILSON,
Exe. Engineer, Kistna Eastern Division.

No. 140 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, II Circle, submits the accompanying estimate, amounting to Rs. 1,570, for extending the Nakkala codu, a branch of the Gudiváda channel of the Pulleru canal, Kistna Eastern delta, for the irrigation of lands lying between the Chintala codu and Gudiváda channel, which are intended to be supplied by the former, but do not get a proper supply owing to the codu having a large area under it, and to its F.S.L. not being sufficiently above the lands to be irrigated. The estimate may be sanctioned.

2. The work is classed as "remunerative" and will probably be completed by the 31st March 1901.

25th June 1900.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

ORDER—No. 590 I., dated 10th July 1900.

The estimate, amounting to Rs. 1,570, or Rs. 1,860 including establishment and tools and plant, for extending Nakkala codu, a branch of the Gudiváda channel of the Pulleru canal, Kistna Eastern delta, is sanctioned.

2. This sanction is registered as No. 52 I. of 1900-1901 and will expire on the 31st March 1901.

3. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 591 I., dated 10th July 1900.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with five enclosures.
" Examiner of Public Works Accounts.

ENDORSEMENT—No. 591 I., dated 10th July 1900.

Forwarded.

(By order.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.
PUBLIC WORKS.

Recd. } 1900. *Enclosures*

Regd. *Spare copies*

G.O., No. 592 I., 11th July 1900.

JULY.

Nathanallur Tank, Conjeeveram Taluk, Chingleput District

The execution by the Public Works Department of the work of repairing and improving the —, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

From Colonel A. W. SMART, R.E., Superintending Engineer, V Circle, to the Chief Engineer for Irrigation, dated Chepâk, 29th June 1900, No. 240 E.I.

I have the honour to request sanction under paragraph 79, Chapter IX, Volume I of the Public Works Code, to the work "Repairs and improvements to Minor Irrigation work, Public Works Department, No. 284, Nathanallur tank in Conjeeveram taluk" as per enclosed estimate being undertaken by this department.

2. The contribution to be recovered from the shrotriemdars who are benefited to the extent of two-thirds the ayacut under the tank amounts to Rs. 1,514, of which Rs. 396–4–0 has been recovered from one of the shrotriemdars. The Tahsildar of the taluk has been directed by the Collector of Chingleput to arrange for the collection of the balance Rs. 1,117–12–0.

3. A copy of letter, Ref. on No. 909/01 of 1896, dated 2nd June 1900, from the Collector of Chingleput, is forwarded herewith for information.

ENCLOSURE.

From D. W. G. COWIE, Esq., Acting Collector of Chingleput District, to the Executive Engineer, Chingleput Division, dated Saidapet, 2nd June 1900, Ref. on No. 909/01 of 1896.

Adverting to your letter No. 47 C.O., dated 21st May 1900, requesting to be informed whether the contribution due from the shrotriemdars of Nathanallur towards the repairs of Nathanallur Hissa tank has been recovered, I have the honour to state that on the application of one of the shrotriemdars to permit him to pay his contribution in two years' time with interest at 6 per cent. per annum, the Tahsildar has been called on to report whether there are special circumstances preventing the shrotriemdar from paying the contribution in a lump. The Tahsildar's report is awaited.

2. As regards the payment of the other shrotriemdars, the Tahsildar reported that he had already deposited Rs. 396–4–0 in the treasury and promised to pay the balance soon. The Tahsildar has been directed to at once take steps to collect the balance and report the fact as early as possible. On receipt of his reply I shall address you again on the subject.

3. In your letter No. 2276, dated 5th September 1898, you have requested me to collect from the shrotriemdars Rs. 371, being the charges for establishment, tools and plant. It would, however, seem that in accordance with the G.O., No. 1710 W., dated 5th July 1899, received with your letter No. 14 C.O., dated 19th April 1900, the shrotriemdars cannot be made liable to pay those charges, as the work is to be carried out partly from funds provided in the Public Works Department estimate and partly from contribution exclusive of these charges ; the amount of contribution due from them is only Rs. 1,514.

4. The estimates and plans concerned are herewith sent.

Order—No. 592 I., dated 11th July 1900.

The execution by the Public Works Department of the work referred to is sanctioned, the contribution due being credited thereto when realized.

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, V Circle,
with fifteen enclosures.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd. } 1900. *Enclosures*

Regd. *Spare copies*

G.O., Nos. 593, 594 I., 12th July 1900.

JULY.

Inspection Bungalow at Nedungal, Salem District

Forwarding copy of Proceedings sanctioning the estimate of Rs. 3,080 for constructing an — .

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—again the following paper :—

G.O., No. 8 I., dated 10th January 1900.

READ—also the following paper :—

From Sub-Conductor S. HEARNE, Officiating Executive Engineer, Salem Division, to the Superintending Engineer, IV Circle, dated 29th May 1900, No. 261.

With reference to your endorsement No. 164 S.L., dated 16th May 1900, I have the honour to enquire whether the estimate therein referred to should not be classed under 43. Minor Works, etc., kept—Capital (Open Capital) account, for the following reasons :—

The value of the old inspection shed with out-houses at Nedungal is Rs. 610 and I think that this amount was originally charged to the Capital account of the Barur tank project. The project was originally classed as a productive public work, but was subsequently transferred to the head 43. Provincial, owing to its unremunerative character. The new inspection shed with out-houses now under reference is intended to replace the old building referred to above (*vide* the penultimate sentence of the Chief Engineer's note printed with G.O., No. 8 I. of 10th January 1900). As the estimated cost of the new work exceeds the cost of the original work by Rs. 1,898, I think that under Code, Volume II, Chapter V, paragraph 37, or Chapter IX, paragraph 13, the outlay on the new work should be charged to the Capital account and the value of the existing building should be written back from the Capital to the Revenue account.

2. The sale-proceeds of the old building will, when realized, be credited to XXIX. Major works—Direct receipts, in the event of the incidence of the charges proposed in paragraph 1 being approved.

3. I request early orders on the subject to enable me to apply for the necessary allotment of funds under the proper head of account, as the work has already been put in hand.

No. 123/I.

Copy submitted to the Chief Engineer for Irrigation for favour of orders with reference to G.O., No. 8 I., dated 10th January 1900.

OOTACAMUND,
7th June 1900.

(Signed) A. H. GARRETT,
Supg. Engineer, IV Circle.

ORDER—No. 593 I., dated 12th July 1900.

The following estimate is sanctioned, in supersession of the estimate of Rs. 2,500 sanctioned in G.O., No. 8 I., dated 10th January 1900 :—

Provincial.
Irrigation.
43. Minor Works and Navigation.
Minor Works and Navigation for which Capital and Revenue Accounts are kept.
Barur Tank Project.
Open Capital Account.
I. Head Works.
5. Buildings.
Unremunerative Work.
Constructing an Inspection Bungalow with out-houses at Nedungal.

	RS.
I. Works	2,500
II. Establishment	575
III. Tools and Plant	5
Total, Estimate ...	3,080

2. This sanction is registered as No. 53 I. of 1900–1901 and will expire on the 31st March 1901.

3. The value of the old bungalow with out-houses, viz., Rs. 610, will be written back by the Examiner of Public Works Accounts from the Capital to the Revenue account of the Barur tank project in accordance with paragraph 13, Chapter IX, Volume II, Public Works Department Code.

4. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 594 I., dated 12th July 1900.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, IV Circle.
„ Examiner, Public Works Accounts.

ENDORSEMENT—No. 594 I., dated 12th July 1900.

Forwarded.

(By order.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd. } 1900. *Enclosures*

Regd. *Spare copies*

G.O., Nos. 596, 597 I., 14th July 1900.

JULY.

Tenali Road Bridge

Forwarding copy of Proceedings sanctioning the estimate of Rs. 7,300 for constructing the — over the Kopalli drain in the Kistna Western delta.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers:—

From the Superintending Engineer, II Circle, dated 29th August 1898, No. 2683 K.W.
To the „ „ II „ „ 9th Sept. 1898, No. II./151 K.S.

From J. M. LACEY, Esq., Executive Engineer, Kistna Western Division, to the Superintending Engineer, II Circle, dated 24th March 1900, No. 605 S.

With reference to your No. 100 K.W., dated 30th January 1899, I have the honour to forward, herewith, plan and estimate, amounting to Rs. 5,870,* for constructing Tenali road bridge over Kopalli drain, duly prepared as per instructions contained in the letter under reference for favour of sanction.

* Corrected in Superintending Engineer's office as Rs. 5,920.

2. The report accompanying the estimate explains the necessity for the same.

3. All the points referred to in Chief Engineer's memo. No. II./151 K.S., dated 9th September 1898, were already explained in my No. 523 S., dated 25th January 1899.

4. A site plan showing the proposed site of bridge, together with sections of the drain, is herewith sent. Provision has been made in the estimate for widening the drain above and below bridge for a distance of 100 yards to a bottom width of 33 feet as instructed.

5. The nature of surface and sub-soil is black cotton and 4 feet depth of foundations has been allowed.

Enclosure.

Report to accompany the estimate for constructing Tenali road bridge over Kopalli drain.

	RS.
Amount of estimate	5,920

The estimate for the excavation of the Kopalli drain for Rs. 5,100 was sanctioned in G.O., No. 39 I., dated 14th January 1893. The work was completed in the year 1895. At the time, of the preparation of the estimate, provision was not made for a masonry bridge, where the drain crossed the road, for reasons given in paragraph 7 of the report, from which the following is an extract:—

* * * * *

"The existing road side drain is passed under the road by a small tunnel of inadequate dimensions, and there is a well defined channel below the road, which joins the Tungabhadra. It is proposed to stop the proposed drain at the point, where it joins the existing road side drain for

the present and not to erect a new masonry work in the road until the final line, hydraulic and other details connected with the Tungabhadra side channel are determined. The Tungabhadra side channel will eventually take off from the Commamur canal left bank a little below the Kopalli stop bank, will run parallel to the proposed drain as far as the road, and the cheapest arrangement will probably be a combined bridge and aqueduct at the road, the bridge to carry the road over the drain and the aqueduct to carry the side channel over the drain below the road."

The existing road tunnel was, therefore, widened by the addition of a temporary palmyra bridge.

2. This temporary bridge was in bad order and was repaired last year. In the beginning of this year, it collapsed entirely and is now being put up again. The road connects the two important places Tenali and Guntur and the traffic is consequently very heavy. A masonry bridge is, therefore, absolutely necessary.

3. The final line for the Tungabhadra side channel has now been settled and it crosses the drain by means of an undertunnel at 0/4 about 2 miles above the place, where the road crosses it; consequently a combined work is unnecessary now.

4. The drainage area of the Kopalli drain is 3 square miles and that of the road side drain which joins it just above the road is another 3 square miles. The total drainage area is therefore 6 square miles, and the maximum discharge ($D = 450 M^{\frac{3}{4}}$) = 1,485 cubic feet per second. The waterway provided for the bridge is 210 square feet and the discharge through the bridge with velocity of 3 feet will be 630 cusecs, *i.e.*, the whole drainage will be discharged in 2·4 days; the afflux being 3 inches.

5. Provision has been made in the estimate for widening the drain above and below the bridge for a distance of 100 yards, as per Superintending Engineer's orders.

6. The size of the centre girder is 12″ × 6″ weighing 40 lb. per foot run and that of the side girder is 8″ × 5′ weighing 26·7 lb. per foot run. The safe working loads of these girders are 13·16 and 5·5 tons, respectively (*vide* pages 184 and 185 of Messrs. Richardson & Cruddas' catalogue of 1898) which are considered ample for the proposed bridge.

No. 55 I.

Forwarded to the Chief Engineer for Irrigation with reference to his No. II./151 K.S., dated 9th September 1898, for favour of sanction of Government being obtained under "open capital account," plans and estimates, amounting to Rs. 5,920, for constructing Tenali road bridge over Kopalli drain.

(Signed) J. HANNAN,
Supg. Engineer, II Circle.

23rd May 1900.

No. 142 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, II Circle, submits the accompanying estimate, amounting to Rs. 5,920, for constructing Tenali road bridge over the Kopalli drain, in the Kistna Western delta, which was excavated in 1895 under the sanction accorded in G.O., No. 39 I., dated 14th January 1893. No provision was made for this work in the estimate for the drain as it was considered advisable to postpone its construction pending the determination of the line of the Tungabhadra side channel which, it was thought, would run parallel to the drain as far as the road, rendering possible the construction of a combined bridge and aqueduct, the former to carry the road, and the latter the side channel, over the drain, at a much less cost than two separate works. The line of the Tungabhadra side channel has since been settled (*vide* G.O., No. 50 I., dated 19th January 1898), and it crosses the drain by means of an undertunnel about 2 miles above the place where the road crosses it. The construction of the proposed bridge is considered absolutely necessary, and the estimate may be sanctioned.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

29th June 1900.

ORDER—No. 596 I., dated 14th July 1900.

The following estimate is sanctioned :—

Capital expenditure not charged to Revenue.
49. Irrigation.
Kistna Delta System.
Western Section.
Open Capital Account.
I. Works.
4. Drainage and Protective Works.
Kopalli Drain.
Unremunerative Work.
Constructing Tenali Road Bridge.

	RS.	RS.
2. Land—		
(1) Compensation for land	30	30
3. Works—		
(2) Constructing bridge	5,660	5,660
4. Earthwork—		
(3) Widening drain	230	230
Total, I. Works		5,920
II. Establishment ...		1,355
III. Tools and plant ...		25
Total, Estimate ...		7,300

2. This sanction is registered as No. 54 I. of 1900-1901, and will expire on the 31st March 1901.

3. Ordered that a copy of these proceedings be forwarded to the Government of India for information.

[Here enter No. 597 I., dated 14th July 1900.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with ten enclosures.
" Examiner of Public Works Accounts.

ENDORSEMENT—No. 597 I., dated 14th July 1900.

Forwarded.

(By order.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd. } 1900. *Enclosures*

Regd. *Spare copies*

G.O., Nos. 598, 599 I., 14th July 1900.

JULY.

River Embankment, Bank Canal, Godavari Eastern Delta

Forwarding copy of Proceedings sanctioning the estimates, amounting to Rupees 65,900 and Rs. 3,000, respectively, for the diversion of the — and of the Teki side channel; and approving with remarks the estimate of the Rs. 17,350 for the diversion of the Bank canal.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

Inspection notes of the Suptg. Engr.,	I Circle,	dated	2nd Nov.	1898,	No.	1645 G.D.
From the Superintending Engineer,	I „	„	7th Dec.	1899,	„	2531 G.E.
To the „	I „	„	18th „	„	„	I/103 G.D.
From the „	I „	„	20th Jan.	1900,	„	106 G.E.
To the „	I „	„	12th Mar.	„	„	I/14 G.D.
From the „	I „	„	22nd „	„	„	617 G.E.
To the „	I „	„	28th „	„	„	I/19 G.D.
From the „	I „	„	2nd April	„	„	717 G.E.
From the „	I „	„	13th June	„	„	1302 G.E.

Estimate Form—Abstract—Classified.

Sub-head.	Names of works.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.
1	2	3	4	5	6
	PROVINCIAL.	RS.	RS.	RS.	RS.
	43. MINOR WORKS AND NAVIGATION.				
	Class V.				
	Agricultural Works.				
	Original Works.				
	Gódávari Eastern Division.				
	Diversion of river embankment at Korumalli 17 miles 4 furlongs to 20 miles 4 furlongs of Bank Canal.				
	Estimate	..	..	..	65,900
	CAPITAL EXPENDITURE NOT CHARGED TO REVENUE.				
	49. IRRIGATION.				
	Gódávari Delta System.				
	Open Capital Account.				
	Eastern Section.				
	3. Distributaries.				
	Unremunerative Work.				
	Bank Canal.				
	Diversion of Teki side channel at 17/4 of Bank Canal.				
2. Land ..	Compensation for land	1,489			
	„ for trees	76			
	„ for crop	120			
			1,685		
4. Earthwork ..	Diversion	1,519			
			1,519		
5. Miscellaneous.	Demarcation stones	36			
			36		
	Total, I. Works	..	..	3,240	
	II. Establishment ..	..	..	358	
	III. Tools and plant ..	..	..	2	
	Total, Estimate ..	..	..	..	3,600

Estimate Form—Abstract—Classified.

Sub-head.	Names of works.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.
1	2	3	4	5	6
	CAPITAL EXPENDITURE NOT CHARGED TO REVENUE.	RS.	RS.	RS.	RS.
	49. IRRIGATION.				
	Gódávari Delta System.				
	Eastern Section.				
	Open Capital Account.				
	2. Main Canals and Branches.				
	Bank Canal.				
	Unremunerative Work.				
	Diversion at Korumalli from 17 miles 4 furlongs to 20 miles 4 furlongs.				
2. Land ..	1. Compensation for land	7,795			
	2. " for trees	400			
	3. " for crop	628			
			8,823		
12. Earthwork ..	4. Diversion	6,898			
			6,898		
15. Miscellaneous.	5. Demarcation stones	39			
			39		
	Total, I. Works	..	..	15,760	
	II. Establishment ..	..	..	1,573	
	III. Tools and plant ..	..	..	17	
	Total, Estimate ..	..	..	..	17,350

28th June 1900.

(Signed) R. N. H. REID,
for Chief Engineer for Irrigation.

No. 143 I.

Note by the Chief Engineer for Irrigation.

In the first of the papers read above the Superintending Engineer, I Circle, brought to notice that the margin of the Gowtami branch of the Gódávari river was approaching very near to the left flood bank, in the 19th and 20th miles of the Bank canal, Gódávari Eastern delta, and that a diversion of the bank and canal would be necessary. A survey was ordered and estimates prepared which, however, were delayed for want of information in respect of the amount to be allowed for land compensation which had to be obtained from the Revenue Department. The cost of the work required was distributed over three estimates aggregating Rs. 84,900 as shown in the margin, some Rs. 47,454 being for land compensation. The first two estimates were classed by the Superintending Engineer, I Circle, under the head "repairs" and sanctioned by him, and the third estimate was submitted for the sanction of Government with the Superintending Engineer's letter No. 2531 G.E., dated 7th December 1899. As it was considered that the whole of the work was of the same character, the Superintending Engineer was directed to submit all three of the estimates for the sanction of Government under the head "original works" which he accordingly now does.

		RS.
(1)	Diverting river embankment ...	65,900
(2)	" Bank canal	15,760
(3)	" Teki side channel ...	3,240
		84,900

2. The work which was necessary has been practically completed, and is recommended for sanction. The first estimate of Rs. 65,900 it is proposed to charge to

"Class V—Agricultural—Original works" and the other two, amounting to Rs. 15,760 and Rs. 3,240, to the Open Capital account of the Gódávari delta system.

3. The diversion of the Bank canal and of the Teki side channel are classed as "unremunerative works," and will probably be completed by the 31st March 1901.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

29th June 1900.

ORDER—No. 598 I., dated 14th July 1900.

The estimates for the diversion of river embankment at Korumalli from 17 miles 4 furlongs to 20 miles 4 furlongs of Bank canal, Gódávari Eastern delta, and for the diversion of Teki side channel at 17/4 mile, Bank canal, amounting, respectively, to Rs. 65,900 and Rs. 3,600 * are sanctioned, the former under "Class V—Agricultural Original works," and the latter against the Open Capital account of the Gódávari delta system.

* Including establishment and tools and plant charges.

2. These sanctions are registered as Nos. 55 I. and 56 I. of 1900–1901. The sanction accorded against the Open Capital account of the Gódavari delta system will expire on 31st March 1901.

3. The approximate original cost, viz., Rs. 500, of the portion of the Teki side channel to be replaced by the proposed diversion will be written back by the Examiner of Public Works Accounts from the "Capital" to the "Revenue" account of the Gódávari delta system in accordance with paragraph 37, Chapter V, Volume II, Public Works Department Code.

4. The estimate, amounting to Rs. 15,760, or Rs. 17,350 including establishment and tools and plant, for the diversion of the Bank canal at Korumalli from 17 miles 4 furlongs to 20 miles 4 furlongs, in the Gódávari Eastern division, is approved.

5. Ordered that a copy of these Proceedings be forwarded to the Government of India, together with the plans and estimate for the work referred to in the preceding paragraph, with a request that sanction thereto may be accorded at an early date under "49. Capital expenditure not charged to Revenue," Gódávari delta system.

[Here enter No. 599 I., dated 14th July 1900.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, I Circle, with enclosures.
,, Examiner, Public Works Accounts.

ENDORSEMENT—No. 599 I., dated 14th July 1900.

Forwarded.

(By order.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd. } 1900. *Enclosures*

Regd. *Spare copies*

G.O., No. 608 I., 20th July 1900.

JULY.

Arkenkota Channel, Coimbatore District

The estimate of Rs. 2,660 for re-sluicing the —, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From A. H. GARRETT, Esq., Superintending Engineer, IV Circle, to the Chief Engineer for Irrigation, dated Coimbatore, 16th June 1900, No. 126/I.

I have the honour to submit herewith for the sanction of Government two estimates, one amounting to Rs. 2,300 for re-sectioning, and the other to Rs. 2,160 for re-sluicing from the head to 5½ miles of the Arkenkota channel in the Coimbatore district.

2. Cement pipes, and a cheap design for sluices, have been adopted in the re-sluicing estimate in order to keep the estimate amount as low as possible.

3. The necessity for the works is explained in the respective reports which accompany the estimates.

4. On the estimates being sanctioned, the Executive Engineer will be instructed to get the cement pipes from the Kistna division as ordered in your note recorded in G.O., No. 752 I., dated 30th September 1898.

Enclosure.

Report to accompany the estimate for re-sluicing the Arkenkota channel head to 5½ miles.

	RS.
Amount of estimate	2,160

As pointed out in the report which accompanied the estimate for re-sectioning the Arkenkota channel, re-sluicing can have a beneficial effect only if done after the channel is regularised and, in preparing the estimate, the level that water will take in the channel after re-sectioning, as graphically deduced, has been assumed as the basis of calculation.

2. In grouping the old sluices, they will not be taken necessarily in order in replacing them with new ones, for some of them are situated needlessly far up the channel, and are thus at a considerable distance from the lands irrigated by them. For instance, new sluice No. 6 will replace old sluices Nos. 10, 11 and 13 but not 12, because the lands under 12 are further down than those under 13, and can be better commanded by new sluice No. 7 which can also command the lands under old sluice No. 14.

3. It will be seen from the re-sluicing statement that the loss of head which will in a few cases occur in replacing 70 old sluices by 30 new sluices will not materially affect the supply of water to the lands to be irrigated. The position of the sluices and the lands under them are shown in the village map accompanying the estimate. The sills of the sluices have, as will be seen from columns 14 and 15 of the re-sluicing statement, been fixed according to the levels of the fields to be irrigated.

4. The formula quoted in Professional Circular No. 45 C., dated 2nd February 1898, allowing a duty of 30 acres per cubic feet per second has been used to calculate the dimensions of the sluices.

5. For big sluices, which with ordinary water level will have small heads, no gearing has been provided.

6. As 3″, 5″, 7″ and 11″ cement pipes are not manufactured by Messrs. Arbuthnot & Co., Madras, it is proposed to use 4″, 6″, 8″ and 12″ pipes in their places.

13th May 1900.

(Signed) C. H. B. BURLTON,
Executive Engineer.

No. 146 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, IV Circle, submits the accompanying estimate, amounting to Rs. 2,160, for re-sluicing the Arkenkota channel, from head to 5½ miles. The estimate may be sanctioned.

2. The estimate for re-sectioning the channel being within the Superintending Engineer's powers of sanction, has been approved and returned to him for sanction under "Maintenance and Repairs" of the Arkenkota channel system.

12th July 1900.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

ORDER—No. 608 I., dated 20th July 1900.

The following estimate is sanctioned:—

Provincial.
Irrigation.
43. Minor Works and Navigation.
Class II—Minor Works and Navigation for which Capital and Revenue Accounts are kept.
Arkenkota Channel System.
Open Capital Account.
1. Works.
2. Main Canals and Branches.
3. Regulators.
Re-sluicing the Arkenkota Channel from head to 5½ miles.

Estimate—

	RS.
I. Works	2,160
II. Establishment	497
III. Tools and plant	3
Total ...	2,660

2. This sanction is registered as No. 59 I. of 1900-1901, and will expire on the 31st March 1901.

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, IV Circle,
with eight enclosures.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd. } 1900. *Enclosures*

Regd. *Spare copies*

G.O., No. 609 I., 20th July 1900.

JULY.

Ponnalur Tank Project

The estimate for the — in the Nellore division, re-sanctioned under "43. Minor Works and Navigation."

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), Mis. No. 2341, dated 14th May 1900.
To the Board of Revenue, dated 18th May 1900, No. 129 M.
Proceedings of the Board of Revenue, Mis. No. 2725, dated 2nd June 1900.
To the Superintending Engineer, II Circle, dated 18th June 1900, No. II/33 N.L.
From the „ „ II „ „ 29th „ „ „ 87 I.

General Report—Ponnalur Tank Project.

	RS.
Amount of estimate	1,54,200

I. Position and description.—This estimate provides for improving a small tank in the village of Ponnalur, 8 miles to the west of Kandukur, Nellore district.

Proposed improvements.—The tank is known as "Dharmagunta" and is situated about a mile to the north-west of Ponnalur. It has a catchment of about one square mile and a low bund half a mile long. It is said to have been formed during early sixties by the merchants of surrounding villages to store up drinking-water for cattle, etc., during hot weather, from funds raised by subscribing among themselves. The Government aided them with a free grant of about 100 acres of land that form its bed. But like most works of the kind, it was neglected afterwards and had been allowed to fall into disrepairs. The Collector, to protect the tank from ruin, issued notices on the parties concerned to restore the tank within a fixed period under the penalty of alienating the land once freely granted. But no action seems to have been taken to repair the tank till now. It is now proposed to improve this tank by raising its F.T.L. considerably, to divert into it the Gudisaleru, a jungle stream flowing into the Paleru by a masonry weir constructed across it, and to supply about 1,000 acres of land with water for irrigation from the storage thus secured.

II. Catchment—Drainage area.—The tank when improved will secure a drainage area of 32·14 square miles, of which all except 9·34 square miles is free. The heavy fall of the basin and non-absorbent nature of its soil ensures a high run off, and this is borne out by the fair size of the Gudisaleru. The rainfall recorded in Kandukur, a station about 8 miles to the east, shows an average 33·53 inches; of this 6·41 inches fall during the months of June, July and August, while the succeeding four months monopolise 23·42 inches. It is only during these latter months the tank is expected to fill, as a run off of 2·42 inches from the basin will be sufficient. The percentage of run off required to fill the tank is only 7·2 per cent. of the annual average rainfall, or 11 per cent. of the rainfall during the months October to December.

III. Capacity.—The capacity of the tank at F.T.L. proposed is 180·512 millions of cubic feet and the proposed ayacut is 1,000 acres. The tank can hold water sufficient for 840 acres of land for five months at a single fill will absorb about 7·2 per cent. of the annual average rainfall before it fills.

IV. Area to be irrigated.—The extent of the proposed ayacut, viz., 1,000 acres, gives a duty of about 31 acres per square mile of catchment basin or more correctly a duty of 43 acres for every mile of its free basin. This may appear high, but it is not so actually as the duty attained in Cherukur tank (zemindari) situated a few miles higher up is nearly 50 acres, though under rather unfavourable circumstances. The nature of the soil of the ayacut is black earth mixed with a good proportion of sand well adapted for wet cultivation.

V. Tank bund.—The right flank of the weir is connected with high ground by a short earthen bund, while the bund proper may be said to begin from its left flank. Before water is taken to the valley in which the tank is situated, an average cutting of 2·5 to 3 feet has to be faced. So a channel, 250 feet broad and half a mile long with its bed 4 feet below the weir crest, will be taken till it enters the tank bed. In addition, another channel 12 feet broad will be dug in the centre of the supply channel to carry cold weather supply. This has the advantage of preventing sets in the main channel when it runs low and aiding the formation of a non-silting section. The bund will then be taken along a contour about 7 feet below the crest of the weir till it meets the Kanigiri-Kandukur road and then joined on to the old earthen bund. This will be raised to required level and carried on to meet the high ground on the western side. It will be 9 feet wide at top with side slopes 2 to 1. The nature of the soil through which it runs is black earth mixed with sand and well suited for its formation. Its total length is 3 miles 6 furlongs 460 feet and is demarcated at every turning point by granite stones 9 inches square fixed in concrete. The tank will submerge a portion of Kanigiri-Kandukur road. The road will have to be raised, therefore, to 4 feet above M.W.L. and a bridge of five 20-ft. arches constructed across it to admit the supply from the river into the tank.

VI. Weir or surplus escape.—The supply to the tank will be diverted from the Gudisaleru by a masonry dam taken obliquely to the upstream with a view to admit an easy flow of water into it.* This dam serves in addition as an escape for excess water after the tank fills. The weir will be 418 feet long and 6 feet high. It will be built of rough stone in surki mortar and founded on soft rock. The rear cushion will be 3 feet deep and have 3 feet of concrete with a batter 1 in 4 from top of retaining wall to the floor of cushion as shown on plan. The effective length of the weir has, for purposes of calculation, been taken as equal to the normal width of the stream, as the true length lies somewhere between the two. This secures a maximum depth of 3·5 feet over crest. The nature of the soil on which the weir is to be founded has been ascertained to be soft rock at levels noted in the site plan after digging a trench with 4 feet bottom width along the proposed line. The thickness of the drop wall at top is fixed at 4 feet with a batter of 1 in 3 in front.

* The angle selected has been in accordance with instructions of Mr. Hannan, Superintending Engineer.

VII. Sluices distribution.—It is proposed to have three sluices with cills 12 feet below the crest of the weir to supply the ayacut. Water is taken from each of these sluices direct to the field by three minor channels, whose courses have been marked in the village maps. The bed falls of the channels have been fixed with reference to the velocity the soil is able to bear.

VIII. Land compensation—Tank bed.—The extent of land liable to submersion when water rises to 1 foot above F.T.L. was marked on the village plans and submitted to the Collector for estimating the compensation to be paid. The amount has been fixed by that officer at Rs. 15,000 with an annual loss of revenue of Rs. 1,000 to Government.

Distributaries.—The extent of land required for distributaries has been calculated at 36 acres and compensation for the same has been estimated at Rs. 750.

IX. Financial prospects.—The works may be classed as one for which capital and revenue accounts are kept. The cost of the works proposed is as noted below :—

Direct Charges.

	RS.
Tank bund	50,000
Shed for materials	680
Weir	18,300
Maintenace during construction	1,000
Raising road	5,930
Bridge across road	6,190
Sluices and distributaries	5,950
Total ...	88,050
Establishment at 23 per cent.	20,251
Tools and plant	1,349
Compensation for land for tank-bed and distributaries	15,750
Total, Direct charges ...	1,25,400

Indirect Charges.

Capitalized abatement of land revenue at 25 times	26,000
Leave and pension allowances at 14 per cent. on establishment, say.	2,600
Total, Indirect charges ...	28,600
Total, Capital charges ...	1,54,000

The revenue anticipated is as noted below :—

1,000 acres at Rs. 4 per acre	4,000
Deduct—maintenance charges ...	500
Net revenue ...	3,500

This gives a return of 2·27 per cent.

X. General remarks.—The work is situated within the famine zone and will certainly form a good work for execution by famine labour, for which a sum of Rs. 53,000 is available out of the total estimated amount of the project.

Materials.—Concrete rough stone required for weir and sluices can be obtained in the quarry situated in the Cherukur limits about 2 miles to the south of the Kanigiri road and near Taitpettah. Metal and gravel required for the road can be quarried in the quarry situated opposite to Ponnalur village, and to the left of Kanigiri road. Good brick-earth can be had in the bed of the gunta situated to the west of the village of Ponnalur. Good limestones are procurable in the fields lying to the west of the village, while good burnt lime is sold in the village.

(Signed) V. T. SRINIVASA AIYANGAR,
Supervisor.

No. 150 I.

Note by the Chief Engineer for Irrigation.

In G.O., No. 371 I., dated 11th April 1900, an estimate, amounting to Rupees 1,54,000,* for the Ponnalur tank project in the Nellore division, was sanctioned for execution as a famine-relief work, if required. The Collector reports that there is no famine in the Kandukur taluk wherein the project is situated, and recommends that it may be re-sanctioned as an ordinary work, as, otherwise, there is no chance of its being executed in the near future. The

* For direct and indirect charges.

Collector's recommendation, which is supported by the Board of Revenue, may be approved. The work will probably not yield a return of more than 2 per cent. on the expenditure, but will help to prevent famine in a locality very liable to it.

7th July 1900.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

Order—No. 609 I., dated 20th July 1900.

The estimate for the Ponnalur tank project sanctioned in G.O., No. 371 I., dated 11th April 1900, is re-sanctioned under "43. Minor Works and Navigation."

2. This sanction is registered as No. 60 I. of 1900–1901 and supersedes the sanction previously accorded.

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner of Public Works Accounts.
" Board of Revenue (Revenue Settlement, Land Records and Agriculture).

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd. } 1900.
Regd.

Enclosures

Spare copies

G.O., No. 610 I., 20th July 1900.

JULY.

Funds

Sanctioning certain transfer of — under 43. Minor Works and Navigation, V Circle.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

No. 243 E.I.

Application for modification of existing grants under Provincial Irrigation for the year 1900–1901, V Circle.

Item No.	Division.	Works.	Amount of estimate.	Original grant.	Existing grant.	Modification proposed. Decrease.	Modification proposed. Increase.	Revised grant.	Remarks.
		PROVINCIAL IRRIGATION.	RS.	RS.	RS.	RS.	RS.	RS.	
		Class II—Minor Works and Navigation for which Capital and Revenue Accounts are kept.							
		Capital Account.							
		Vriddháchalam Anicut System.							
1	South Arcot.	Improving the Vriddháchalam anicut.	22,700	..	..	..	10,500	10,500	Required for expenditure in the current official year under different sub-heads of the work as per statement submitted by the sub-divisional officer. The work is an incomplete one of the last year.
		Revenue Account.							
		Lower Coleroon Anicut System.							
2	South Arcot.	Maintenance and repairs ..	L.S.G.	15,040	15,040	..	4,960	20,000	Additional grant is required for urgent work to be put in hand.
		Shatiatope Anicut System.							
3	South Arcot.	Maintenance and repairs ..	L.S.G.	15,000	15,000	7,460	..	7,540	Not required as there are no urgent estimates to be put in hand.
		Class IV—Other Minor Works for which neither Capital nor Revenue nor individual accounts are kept.							
		(*a*) *In charge of the Public Works Department.*							
		Major Original Works.							
4	South Arcot.	Re-constructing the Alathur anicut across the Cheyar, etc.	30,700	10,000	10,000 + 5,738 since locally sanctioned	..	2,500	18,238	Additional grant of Rs. 2,500 is necessary for completing the important parts of the project this year (to be met from item 3).

Submitted to the Chief Engineer for Irrigation, with request that he will be so good as to obtain the sanction of Government to the modifications herein applied for.

Chepâk,
5th July 1900.

(Signed) A. W. SMART, Colonel, R.E.,
Supg. Engineer, V Circle.

No. 148 I.

Submitted to Government.

There are no funds available, at present, to meet the Superintending Engineer's demand for item 1.

14th July 1900.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

ORDER—No. 610 I., dated 20th July 1900.

The following transfers of funds are sanctioned :—

Provincial.
Irrigation.
43. Minor Works and Navigation.
South Arcot Division.

From

Class II—Minor Works and Navigation for which Capital and Revenue Accounts are kept.
Revenue Account.
Shatiatope Anicut System.

	RS.
Maintenance and repairs	7,460
Establishment	1,716
Total ...	9,176

To

Class II—Minor Works and Navigation for which Capital and Revenue Accounts are kept.
Revenue Account.
Lower Coleroon Anicut System.

	RS.	RS.
Maintenance and repairs ...	4,960	
Establishment	1,141	
		6,101

Class IV—Other Minor Works for which neither Capital nor Revenue nor individual Accounts are kept.
(*a*) In charge of the Public Works Department.
Ordinary Works.
Original Works.

	RS.	RS.
Reconstructing the Alathur anicut across the Cheyar ...	2,470	
Establishment	568	
Tools and plant	37	
		3,075
Total ...		9,176

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, V Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd.	} 1900.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 611 I., 20th July 1900.

JULY.

Staff Boats

Note by the Chief Engineer for Irrigation on the statement submitted by the Superintending Engineer, III Circle, showing the working of the — belonging to the Kurnool-Cuddapah canal for 1899–1900, recorded.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers:—

No. 314.

Statement showing the date of completion, earnings, &c., of the Staff Boats constructed, purchased in Kurnool division, III Circle, for 1899 to 1900.

Boat number.	Class of boat and name.	Date of completion or purchase and cost. Year.	Amount.	Monthly rent.	Amount recovered up to end of March 1900.	Amount spent on repairs up to end of March 1900.	Amount reserved for repairs and reconstruction to end of March 1900.	Remarks.
1	2	3	4	5	6	7	8	9
			RS.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	
	Staff Boats.							
10	Duke	1879-80 / 1882-83	4,213	1 8 0 per day.	1,864 5 1	3,491 4 8	—1,626 15 7	Used by Superintending Engineers and District officers.
11	Chairman ..	,,	4,213	24 0 0	2,242 4 11	3,853 13 11	—1,611 9 0	Used by the Executive Engineer.
8	Sir Arthur ..	,,	4,213	24 0 0	2,823 11 4	2,995 1 11	171 6 7	Used by Sectional officers and District officers.
	Pulicat No. 1 ..	1891-92	200	2 8 0	67 14 6	138 3 3	70 4 9	Used by Overseer in charge of 4th and 5th sections.
	Do. ,, 2 ..	,,	200	2 8 0	98 9 0	100 1 3	1 8 3	Used by Overseer in charge of 1st and 2nd sections.
	Passenger Boats.							
4	Rat	1879-80 / 1882-83	4,435	12 0 0	1,743 4 3	3,334 15 0	1,591 10 9	Used by Overseer in charge of 2nd and 3rd sections.
5	Peacock ..	,,	4,435	12 0 0	1,794 4 9	2 960 7 2	1,166 2 5	Used by Lower Sub-divisional officer.
6	Elephant ..	,,	4,435	12 0 0	1,589 4 4	3,228 3 2	1,638 14 10	Used by Overseer in charge of 5th and 6th sections.
9	Ram	,,	4,435	12 0 0	1,498 10 9	3,570 12 11	2,072 2 2	Used by Upper Sub-divisional officer.
	Cargo Boats.							
2	Kite	1879-80 / 1882-83	4,435	45 0 0	2,186 5 8	2,814 9 11	628 4 3	Used by private persons and on Government works.
56	Seetha	,,	4,505	45 0 0	2,840 4 8	2,478 11 4	361 9 4	
62	Queen Boadicea ..	,,	4,505	45 0 0	3,433 15 3	2,592 10 7	841 4 8	
63	Do. Scott ..	,,	4,505	45 0 0	3,009 15 0	2,728 2 11	281 12 1	
	Four punts ..	1885-86	280	..	..	107 12 2	107 12 2	
	Pinnaces ..	1895-96	200	..	..	..	..	
				Total ..	25,192 13 6	34,394 14 2	9,202 0 8	
	Deduct—receipts and charges to end of 1898-99 ..				23,615 10 1	33,415 3 9	9,799 9 8	
	Net receipts and charges during 1899 to 1900 ..				1,577 3 5	979 10 5	597 9 0	
	Add—refunds during 1899-1900				0 0 1	..	..	
				Total ..	1,577 3 6	..	..	

23rd April 1900.

(Signed) J. C. JOHNSTON,
Executive Engineer.

No. 1735 I.

Forwarded to the Chief Engineer for Irrigation, Madras.

2. The receipts and charges of the boats during 1899–1900 amounted to Rupees 1,577–3–5 and Rs. 979–10–5, respectively, the corresponding figures of the previous year being Rs. 1,244–9–3 and Rs. 1,067–15–1.

10th May 1900. (Signed) W. L. C. BADDELEY, Lieut.-Col., R.E.,
Supg. Engineer, III Circle.

To the Examiner of Public Works Accounts, dated 14th May 1900, No. 138.
Office-note from the Examr., P.W. Accounts „ 19th „ „ „ 1472 B./A.

No. 149 I.

Note by the Chief Engineer for Irrigation.

The accompanying statement submitted by the Superintending Engineer, III Circle, shows the financial results of the working of the staff boats belonging to the Kurnool-Cuddapah canal for 1899–1900. The net amount realized from the boats or excess of receipts over charges during the year was Rs. 597–9–1, or Rupees 597–9–0 omitting refunds of expenditure during the year, against Rs. 181–4–6 and Rs. 176–10–2, respectively, during the previous year.

7th July 1900. (Signed) W. HUGHES,
Chief Engineer for Irrigation.

ORDER—No. 611 I., dated 20th July 1900.

Recorded.

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, III Circle.
„ Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.
PUBLIC WORKS.

Recd.	1900.	*Enclosures*	
Regd.		*Spare copies*	

G.O., No. 612 I., 21st July 1900.

JULY.

Supply channel from Penner river to Hindupur Tank

The revised estimate, amounting to Rs. 4,260, for improvements to the head of the — in the Anantapur district, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From the Superintending Engineer, III Circle, dated 13th June 1900, No. 2201 I.

No. 147 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, III Circle, submits the accompanying revised estimate, amounting to Rs. 4,260, for improvements to the head of the supply channel from the Penner to Hindupur tank, in the Anantapur district, involving an excess of Rs. 370 over the sanction accorded in G.O., No. 1024 I., dated 2nd December 1896. The excess is reported to be chiefly due to the necessity for increasing the rate for stone revetment with reference to the distance of the quarry from the work, and to the extension of the revetment by 45 feet owing to a small scour. The revised estimate may be sanctioned.

12th July 1900.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

Order—No. 612 I., dated 21st July 1900.

The following revised estimate is sanctioned, in supersession of the estimate of Rs. 3,890 sanctioned in G.O., No. 1024 I., dated 2nd December 1896 :—

Provincial.
Irrigation.
43. Minor Works and Navigation.
Class IV—Other Minor Works for which neither Capital nor Revenue nor individual accounts are kept.
(*a*) In charge of the Public Works Department.
Bellary Division.
Original Works.

Improvements to the head of the supply channel from Penner river to Hindupur tank, No. 44 of the list of works in the Anantapur district, appended to G.O., No. 407 I., dated 6th July 1887.

	RS.
Estimate	4,260

2. This sanction is registered as No. 61 I. of 1900–1901.

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Chief Engineer for Irrigation, Tank Restoration Scheme.
„ Superintending Engineer, III Circle,
with two enclosures.
„ Examiner of Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd.	1900.	*Enclosures*	
Regd.		*Spare copies*	

G.O., Nos. 613, 614 I., 21st July 1900.

JULY.

Expenditure on Irrigation, Navigation and Agricultural Works during 1899-1900

Forwarding copy of Proceedings passing remarks on the note by the Chief Engineer for Irrigation reviewing the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers:—

No. 144 I.

Note by the Chief Engineer for Irrigation.

The accompanying two statements which compare the expenditure incurred on Irrigation, Navigation and Agricultural works during 1899-1900 with the final grants of the year are submitted to Government with reference to G.O., No. 141 W., dated 13th January 1883.

2. Statement A shows by divisions the grants for, and expenditure on original works and repairs under the several heads, and statement B shows the total grants and expenditure including establishment, tools and plant, etc., for each system and object of works. The figures representing expenditure have been verified by the Examiner of Public Works Accounts, but they do not include the supplementary transactions for March 1900, the figures for which will, it is said, be available only by the 20th proximo (*vide* his office-note No. 1579 B./B., dated 29th May 1900).

3. The total expenditure incurred (*vide* statement B), exclusive of outlay under "33. Famine Relief", amounted to Rs. 50,43,751, against a total final grant of Rupees 51,31,632, as shown below:—

—	Final grant.	Expenditure.	Difference, more or less.
Imperial.	RS.	RS.	RS.
35. Protective Works—Irrigation	43,600	41,831	— 1,769
42. Major Works (Working expenses)	14,95,600	15,01,489	+ 5,889
49. Capital expenditure not charged to Revenue	5,81,900	5,40,436	— 41,464
Total ..	21,21,100	20,83,756	— 37,344
Provincial.			
43. Minor Works and Navigation	30,02,832	29,52,370	— 50,462
Local.			
43. Minor Works and Navigation	7,700	7,625	— 75
Grand Total ..	51,31,632	50,43,751	— 87,881
Provincial.			
33. Famine Relief	..	10,242	..

The total lapse excluding famine outlay amounts to Rs. 87,881, or 1·71 per cent. on the whole grant; but this will, it is anticipated, be considerably reduced by the adjustments yet to be made.

4. 35. *Protective Works—Irrigation.*—The small lapse of Rs. 1,769 under this head is attributed chiefly to changes in subordinates and to piece-workers not having called for payment.

5. 42. *Major Works (Working expenses).*—The outlay under this head including establishment and tools and plant charges exceeded the grant by Rs. 5,889; the excess occurs under establishment owing to an increase in the irrigation revenue anticipated. The total outlay on works and repairs, however, fell short of the grants by Rs. 1,359. The final outlay will probably exceed the grants as land charges and liabilities incurred by the Public Works Workshops aggregating Rs. 3,751 have yet to be adjusted in the Gódávari Central and Tanjore divisions. The short outlay under maintenance and repairs in the Ganjám division is ascribed to changes in subordinates and to piece-workers not having called for payment. In the Gódávari Western division the outlay under maintenance and repairs exceeded the grant by Rs. 1,951 owing to more work having been done at the end of the year and to a debit of Rs. 988 for land charges which was not anticipated. In the Kistna Western division the excess outlay of Rs. 1,276 over the grant under extensions and improvements is partly covered by short outlay under maintenance and repairs. Under "tools and plant" there was a lapse of Rs. 1,375 in the Gódávari delta system, which the Executive Engineer, Gódávari Eastern division, attributes to the non-receipt during the year of a fire engine. The short outlay of Rs. 1,683 under this head in the Kistna delta system occurred in the Kistna Eastern division, a portion of the grant for this division having been surrendered too late in the year for acceptance.

6. 49. *Capital expenditure not charged to Revenue.*—The unexpended balance of the grants for works of the Kistna delta system is Rs. 4,299, and is due to claims for land compensation having yet to be adjusted. In the Tanjore division the outlay is Rs. 25,033 below the grant as liabilities incurred on land charges for the work "improvements to the Kangayan channel," sanctioned in G.O., No. 1102 I., dated 9th December 1897, and workshop charges on account of the works—"remodelling the Upper Coleroon anicut" and "conversion of Cauvery-Kodamurti dam into a regulator"—have still to be adjusted. The apparent lapse of Rs. 2,785 under "tools and plant" in the above division will disappear when the cost of tools, etc., supplied by the Public Works Workshops and Stores for remodelling the Upper Coleroon anicut are adjusted in the supplemental accounts for March 1900. The unexpended balance of the grant, viz., Rs. 2,866, for works of the Periyár project in the Madura division represents the amount reserved to meet land compensation charges which have yet to be adjusted.

7. *Provincial*—43. *Minor Works and Navigation—Class II Works—Capital Account.*—The apparent short outlay of Rs. 2,777 on the Munnyeru project in the Kistna Northern division represents the amount reserved for the adjustment of land compensation charges. The short outlay in the Chingleput division is due to an adjustment of previous year's outlay to the extent of Rs. 1,150. In the Tanjore division Workshop liabilities to the extent of Rs. 6,813 on account of shutters supplied to the Lower Coleroon anicut have yet to be adjusted.

8. *Revenue Account.*—The grants under this head were closely worked up to, the total short outlay of Rs. 2,012 under works and repairs being the net result of variations individually small between grants and outlay on the several systems.

9. *Class IV—Other Minor Works for which neither Capital nor Revenue nor Individual accounts are kept—Public Works Department—Ordinary Works.*—The total outlay both under original works and repairs fell short of the grants by Rs. 30,295. In the Ganjám division there was a lapse of Rs. 1,331 under original works, as bills for work done were not received from subordinates. This should not have occurred. The outlay under repairs in the Gódávari Western division fell short of the grant by Rs. 1,147 owing apparently to certian works being under water. In the Kistna Northern division the outlay under original works exceeded the grant by Rs. 1,644, owing chiefly to liabilities incurred by the Public Works Workshops on account of the work "investigation of Mamidivaram reservoir project," and contingent charges in connection with the investigation of projects in the division having been heavier than anticipated. The short outlay of Rs. 5,948 under original works in the Bellary division is due to some of the works having been carried out from funds provided under "33. Famine Relief." In the Cuddapah division the outlay under original works

and repairs fell short of the grant by Rs. 3,618 owing to several changes in subordinates during February and March 1900 due to the starting of famine works. The recovery of outlay under repairs in the West Coast division is due to the credit of the contribution received from the Cochin Durbar, with reference to G.O., No. 451 I., dated 25th May 1899, for the repairs and improvements to the Enamakal dam and the earthen bund connected with it.

10. *Tank Restoration Works.*—The outlay under this head very closely approximated to the grants except in the Cuddapah division where Rs. 1,228 lapsed owing to changes in subordinates necessiated by the starting of famine works. The net short outlay under this head is only Rs. 1,737.

11. *Class IV (b) Minor Works—Revenue Department.*—The total short outlay under both original works and repairs was Rs. 4,000, of which Rs. 1,235 occurred under original works in the Cuddapah division owing to changes in subordinates.

12. *Class V—Agricultural Works.*—The total outlay under both original works and repairs fell short of the grants by Rs. 3,396. In the Gódávari Eastern and Trichinopoly divisions land compensation charges to the extent of Rs. 2,137 and Rs. 1,087, respectively, are expected to be adjusted in the supplemental accounts for March 1900. The excess outlay of Rs. 1,743 under "repairs" in the Kistna Western division will, it is said, be reduced to Rs. 645 when salaries paid to the conservancy establishment are written back to "Provincial establishment—Salaries" with reference to G.O., No. 269 W., dated 3rd February 1900. The variations between grants and outlay in other divisions being trifling, need no comment.

13. *Local*—43. *Minor Works and Navigation.*—The outlay under this head was less than the grants by only Rs. 75.

14. *Provincial*—33. *Famine Relief.*—The outlay of Rs. 10,184 on works under this head was incurred chiefly in the Cuddapah and Bellary divisions, the grant for which is included in the estimate of Rs. 50,794 sanctioned in G.O., No. 328, Financial, dated 27th March 1900, communicated with G.O., No. 1024 W., dated 10th April 1900.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

29th June 1900.

A.—Statement showing by Divisions the Grant for, and the Expenditure incurred on, Original Works and Repairs under Irrigation, Navigation and Agricultural Works during 1899–1900.

Divisions.	Imperial.								Provincial—43. Minor Works and Navigation.									
	35. Protective Works—Irrigation.		42. Major Works (Working expenses).				49. Capital expenditure not charged to Revenue.		Minor Works for which Capital and Revenue Accounts are kept.						Minor Works for which neither Capital nor Revenue nor individual accounts are kept, P.W.D.			
			Extensions and improvements.		Maintenance and repairs.				Capital account.		Revenue account. Extensions and improvements.		Revenue account. Maintenance and repairs.		Original Works.		Repairs.	
	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Ganjám	35,244	33,956	680	943	40,000	38,948	..	..	35,500	35,043	..	..	13,488	13,362	6,800	5,469	6,941	6,177
Vizagapatam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12,187	12,136	14,901	15,517
Gódávari, Eastern	..	..	5,000	5,009	1,14,198	1,15,028	1,932	1,417	..	..	..	..	..	..	2,039	1,967	15,300	15,023
,, Central	..	..	12,500	12,454	76,687	73,325	20,030	20,028	..	..	..	..	..	..	..	..	..	..
,, Western	..	..	9,000	9,468	85,073	87,024	31,568	31,607	..	..	..	..	..	..	3,000	3,418	12,000	10,853
Kistna, Eastern	..	..	6,456	5,969	1,73,844	1,73,668	46,836	47,220	..	..	..	..	..	..	2,200	2,254	5,300	5,235
,, Northern	..	..	..	..	..	..	..	..	28,013	25,258	..	..	3,308	3,343	25,800	27,444	8,000	7,233
,, Western	..	..	5,400	6,676	94,615	93,767	1,08,812	1,04,129	..	..	..	..	..	..	..	..	..	..
Nellore	..	..	4,963	5,061	43,063	43,079	59,985	60,304	..	..	..	..	..	..	6,900	6,202	27,000	26,914
Bellary	..	..	..	..	..	..	..	..	..	..	..	..	..	..	42,844	36,896	52,690	52,881
Cuddapah	..	..	..	..	..	..	..	..	8,285	8,926	900	931	5,100	4,096	13,000	8,042	25,000	26,340
Kurnool	..	..	6,493	6,399	72,565	72,526	..	..	3,342	3,261	..	..	750	667	7,745	7,800	9,982	9,950
West Coast	..	..	..	..	..	..	..	..	..	..	..	..	..	..	760	617	2,000	—7,952
Coimbatore	..	..	..	..	..	..	..	..	13,800	13,425	2,296	2,296	18,800	18,789	8,063	7,959	27,133	26,835
Salem	..	..	200	200	1,170	1,187	..	..	382	382	..	..	..	..	2,500	2,565	7,000	6,921
North Arcot	..	..	..	..	..	..	..	..	8,369	7,844	19,547	19,997	41,828	41,542	24,662	23,446	33,463	33,753
Chingleput	..	..	..	..	..	..	..	..	10,853	9,731	5,738	5,638	91,423	91,047	31,000	30,460	62,520	62,368
South Arcot	..	..	..	..	..	..	..	..	37,003	36,657	15,316	15,159	56,930	56,280	22,677	22,803	65,250	65,813
Tanjore	..	..	8,247	8,172	57,434	56,971	1,18,485	93,452	1,39,000	1,32,187	..	..	4,219	4,192	700	710	1,698	1,610
Negapatam	..	..	8,000	8,368	26,160	27,013	6	249	..	..	..	..	2,642	2,839	..	..	1,600	1,597
Trichinopoly	..	..	17	17	9,383	9,377	..	..	939	939	218	217	5,000	5,000	7,072	6,525	15,113	15,132
Madura	..	..	7,500	6,972	68,500	68,863	64,500	61,634	..	..	..	..	..	..	4,750	4,589	10,350	10,293
Tinnevelly	..	..	300	163	18,100	18,127	6,040	5,969	..	..	620	647	5,082	5,151	8,400	7,448	33,830	33,622
Reserve	..	..	..	..	585	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	35,244	33,956	74,756	75,871	8,81,377	8,78,903	4,58,194	4,26,009	2,85,486	2,73,653	44,635	44,885	2,48,570	2,46,308	2,33,099	2,18,750	4,37,071	4,26,125
Adjustment of old maintenance charges	..	..	— 4,261	— 4,261	—1,36,586	—1,36,586	..	..	..	..	— 6,120	— 6,120	— 6,264	— 6,264	10,381	10,381	1,42,850	1,42,850
Total ..	35,244	33,956	70,495	71,610	7,44,791	7,42,317	4,58,194	4,26,009	2,85,486	2,73,653	38,515	38,765	2,42,306	2,40,044	2,43,480	2,29,131	5,79,921	5,68,975

Statement showing by Divisions the Grant for, and the Expenditure incurred on, Oirginal Works and Repairs under Irrigation, Navigation and Agricultural Works during 1899–1900–*cont.*

Divisions.	Provincial—43. Minor Works and Navigation—*cont.*										Local—43, Minor Works and Navigation.				Total.		33. Famine Relief —Provincial.	
	Tank Restoration works. Execution. Repairs.		Minor works—Revenue Department. Original works.		Minor works—Revenue Department. Repairs.		Agricultural works. Original works.		Agricultural works. Repairs.		Original works.		Repairs.					
	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.	Grant.	Outlay.
	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Gánjam	..	..	248	166	..	..	4,270	4,165	2,200	2,113	..	..	..	..	1,45,371	1,40,342	..	..
Vizagapatam	..	119	2,277	2,015	522	486	764	385	1,400	1,319	..	..	..	..	32,051	32,007	..	402
Gódávari, Eastern	2,00 0	1,982	2,435	2,138	1,815	1,654	..	..	62,629	60,492	..	..	..	..	2,07,348	2,04,710	..	..
„ Central	..	..	..	..	..	..	7,000	6,979	25,000	24,635	75	..	..	..	1,41,292	1,36,821	..	..
„ Western	..	..	1,650	1,288	..	258	3,552	3,046	9,724	9,710	..	..	..	..	1,55,567	1,56,672	..	..
Kistna, Eastern	..	..	..	..	..	..	15,266	15,317	6,553	6,635	..	..	..	..	2,56,455	2,56,298	..	..
„ Northern	5,737	5,713	..	..	..	..	..	..	550	433	..	..	..	..	71,408	69,424	..	794
„ Western	..	..	..	..	..	..	36,000	35,503	92,566	94,309	..	..	..	..	3,37,393	3,34,384	..	..
Nellore	39,010	39,173	1,390	992	..	..	..	..	3,200	3,297	..	..	..	..	1,85,511	1,85,022	..	60
Bellary	15,000	15,063	781	782	4,441	4,355	1,250	1,240	..	..	..	..	..	..	1,17,006	1,11,217	..	1,681
Cuddapah	5,000	3,772	2,370	1,135	..	532	1,030	882	2,970	2,590	..	..	..	..	63,655	57,246	..	6,583
Kurnool	3,778	3,794	..	..	3,744	3,741	..	..	..	..	..	..	..	..	1,08,399	1,08,138	..	664
West Coast	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2,760	—7,335	..	..
Coimbatore	..	..	102	102	968	903	1,320	1,320	7,198	7,215	312	312	188	188	80,180	79,344	..	..
Salem	22,289	22,312	..	..	500	285	..	..	936	933	3,800	3,805	2,200	2,196	40,977	40,796	..	..
North Arcot	73,396	73,339	606	475	1,928	1,905	..	..	..	..	..	..	..	..	2,03,799	2,02,301	..	..
Chingleput	37,550	36,785	..	..	558	366	..	9	9,000	8,985	..	..	..	..	2,48,642	2,45,389	..	..
South Arcot	8,000	7,965	6,803	6,722	3,253	3,091	..	..	9,900	9,876	..	..	..	..	2,25,132	2,24,366	..	..
Tanjore	..	..	2.410	2,089	..	..	700	1,012	82,332	82,605	..	..	..	..	4,15,225	3,83,000	..	..
Negapatam	4,500	4,507	730	555	1,019	912	1,200	1,192	11,992	12,173	..	..	..	..	57,849	59,405	..	..
Trichinopoly	..	..	2,078	1,922	960	850	17,920	16,738	41,799	41,843	..	..	1,125	1,124	1,01,624	99,684	..	..
Madura	19,500	19,496	981	941	27	16	..	..	..	..	..	..	..	..	1,76,108	1,72,804	..	..
Tinnevelly	60,500	60,503	562	551	770	701	31,996	32,406	2,150	2,184	..	..	..	..	1,68,350	1,67,472	..	..
Reserve	..	..	..	..	..	..	..	..	..	..	..	..	..	..	585	..	..	..
Total ..	2,96,260	2,94,523	25,423	21,873	20,505	20,055	1,22,268	1,20,194	3,72,099	3,70,777	4,187	4,117	3,513	3,508	35,42,687	34,59,507	*..	10,184
Adjustment of old maintenance charges	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	2,96,260	2,94,523	25,423	21,873	20,505	20,055	1,22,268	1,20,194	3,72,099	3,70,777	4,187	4,117	3,513	3,508	35,42,687	34,59,507	*..	10,184

* The grant for 33, Famine Relief is included in the estimate of Rs. 50,794 sanctioned in G.O., No. 328 Financial, dated 27th March 1900.

B.—Statement showing by Systems the Grants for and Expenditure incurred on Irrigation, Navigation and Agricultural Works during 1899–1900.

—	Final grants for 1899–1900.					Expenditure incurred in 1899–1900.						
	Original works.	Repairs.	Establishment.	Tools and plant.	Total.	Original works.	Repairs.	Establishment.	Tools and plant.	Refund of revenue.	Less receipts on capital account.	Total.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
IMPERIAL.												
Class I.												
35. *Construction of Protective Irrigation Works.*												
Rushikulya project	35,244	..	8,106	250	43,600	33,956	..	7,816	59	..	..	41,831
42. *Major Works (Working Expenses.)*												
Gódávari delta system	26,500	2,75,958	2,48,766	51,000	6,02,224	26,931	2,75,376	2,64,717	49,625	82	..	6,16,731
Kistna do.	11,856	2,68,459	2,18,639	25,092	5,24,046	12,645	2,67,435	2,05,554	23,409	204	..	5,09,247
Penner river canals system	1,054	17,319	19,165	198	37,736	1,152	17,335	25,315	195	3	..	44,000
Kurnool-Cuddapah canal	6,493	72,565	26,778	1,900	1,07,736	6,399	72,526	24,984	1,716	100	..	1,05,725
Barur tank project	200	1,170	915	..	2,285	200	1,187	955	..	..	..	2,342
Cauvery delta system	16,264	— 12,657	46,706	— 1,181	49,132	16,557	— 12,272	50,344	— 1,233	..	..	53,396
Srívaikuntam anicut system	— 52	12,892	8,743	— 78	21,505	— 189	12,919	9,148	— 78	..	..	21,800
Periyár project	7,500	68,500	22,291	1,089	99,380	6,972	68,863	20,601	2,040	..	..	98,476
Rushikulya project	680	40,000	9,506	650	50,836	943	38,948	9,354	527	..	..	49,772
Reserve	..	585	135	..	720	..	..	..	..	..	..	..
Total ..	70,495	7,44,791	6,01,644	78,670	14,95,600	71,610	7,42,317	6,10,972	76,201	389	..	15,01,489
49. *Capital Expenditure not charged to Revenue.*												
Gódávari delta system	53,530	..	10,931	..	64,461	53,052	..	11,633	..	..	..	64,685
Kistna do.	1,55,648	..	28,502	300	1,84,450	1,51,349	..	29,163	102	..	..	1,80,614
Penner river canals system	59,985	..	13,796	..	73,781	60,304	..	13,849	..	..	..	74,153
Cauvery delta system	1,18,491	..	27,253	26,500	1,72,244	93,701	..	21,442	23,715	..	..	1,38,858
Srívaikuntam anicut system	6,040	..	1,389	..	7,429	5,969	..	1,373	..	..	..	7,342
Periyár project	61,500		14,835	200	79,535	61,634	..	13,150	..	..	..	74,784
Total ..	4,58,194	..	96,706	27,000	5,81,900	4,26,009	..	90,610	23,817	..	..	5,40,436
Total, Imperial ..	5,63,933	7,44,791	7,06,456	1,05,920	21,21,100	5,31,575	7,42,317	7,09,398	1,00,077	389	..	20,83,756
PROVINCIAL.												
43. Minor Works and Navigation.												
Class II.—Minor Works and Navigation for which Capital and Revenue Accounts are kept.												
Capital Account.												
Ganjám minor rivers system	35,500	..	8,050	..	43,550	35,043	..	7,999	..	..	..	43,042
Dondapad tank	..	..	..	..	..	22	..	..	..	..	..	22
Muniyeru project	28,013	..	5,409	150	33,572	25,236	..	5,468	75	..	..	30,779
Chopaud do.	281	..	67	..	351	284	..	65	..	..	..	349
Pálár anicut system	6,911	..	1,589	..	8,500	5,345	..	1,452	..	..	..	6,797
Poiney do.	1,458	..	336	..	1,794	1,349	..	310	..	..	..	1,659

B.—Statement showing by Systems the Grants for and Expenditure incurred on Irrigation, Navigation and Agricultural Works during 1899-1900—*cont.*

—	Final grants for 1899-1900.					Expenditure incurred in 1899-1900.						
	Original works.	Repairs.	Establishment.	Tools and plant.	Total.	Original works.	Repairs.	Establishment.	Tools and plant.	Refund of revenue.	Less receipts on capital account.	Total.
PROVINCIAL—*cont.*	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
43. Minor Works and Navigation—*cont.*												
Class II.—Minor Works and Navigation for which Capital and Revenue Accounts are kept—cont.												
Capital Account—*cont.*												
Lower Coleroon anicut system	1,53,500	..	35,305	..	1,88,805	1,46,727	..	33,747	..	..	..	1,80,474
Thadapalli channel system	4,000	..	920	..	4,920	3,625	..	834	..	..	..	4,459
Kalingaroyen channel system	9,800	..	2,254	..	12,054	9,800	..	2,254	..	..	..	12,054
Shatiatope anicut system	6,836	..	1,572	..	8,408	6,830	..	1,571	— 3,714	..	..	4,687
Cumbum tank	..	..	..	..	..	1,444	..	332	..	..	..	1,776
Chembrambakam tank	..	..	..	..	..	8	..	..	..	..	..	8
Valluru anicut	..	..	..	..	..	— 12	..	— 3	..	..	..	— 15
Pelandorai anicut system	6,014	..	1,384	1,500	8,898	5,912	..	1,360	1,500	..	..	8,772
Nandyar channel	939	..	216	..	1,155	939	..	216	..	..	..	1,155
Buckingham canal	10,853	..	1,610	..	12,463	10,885	..	1,424	42	..	4,429	7,922
Barur tank system	382	..	87	..	469	382	..	88	..	..	..	470
Tirukkóyilúr anicut system	7,750	..	1,783	..	9,533	7,462	..	1,716	..	..	..	9,178
Kurnool-Cuddapah canal	3,342	..	769	..	4,111	1,817	..	386	..	..	..	2,203
Sagileru project	8,001	..	1,840	..	9,841	8,642	..	1,988	..	..	..	10,630
Vriddhachalam anicut	1,903	..	438	..	2,341	1,913	..	440	..	..	..	2,353
Total	2,85,486	..	63,629	1,650	3,50,765	2,73,653	..	61,647	— 2,097	..	4,429	3,28,774
Revenue Account.												
Ganjám minor rivers system	..	13,000	3,020	..	16,020	..	12,945	3,020	..	..	..	15,965
Dondapad tank	..	300	69	..	369	..	335	86	..	..	..	421
Muniyeru project	..	3,008	691	41	3,740	..	3,008	692	37	..	..	3,737
Sagileru project	900	5,100	1,380	..	7,380	931	4,095	1,123	..	..	..	6,149
Cumbum tank system	..	750	173	..	923	..	667	152	..	..	..	820
Chembarambakam tank system	— 2,283	743	— 348	— 109	— 1,997	— 2,283	746	— 352	— 109	..	..	— 1,998
Madras water supply	— 3,600	5,880	2,325	— 10	4,595	— 3,600	5,727	2,431	— 10	..	..	4,548
Valluru anicut system	..	503	117	..	620	..	480	110	..	..	..	590
Pálár do.	16,469	34,549	11,957	— 4	62,971	16,871	34,289	11,632	— 4	15	..	62,803
Poiney do.	3,500	7,670	2,599	..	13,769	3,534	7,645	2,589	..	..	..	13,768
Cheyaru do.	3,900	8,700	2,928	..	15,528	3,913	8,700	2,926	..	..	..	15,539
Tirukkóyilúr anicut system	5,300	10,190	3,624	..	19,114	5,190	10,137	3,643	..	..	..	18,970
Mehamattur do.	2,202	5,100	1,683	..	8,985	2,171	5,098	1,670	..	..	..	8,939
Vriddhachalam do.	4,000	5,500	2,215	..	11,715	3,995	5,437	2,171	..	..	..	11,603
Shatiatope do.	1,450	10,000	2,694	..	14,144	1,440	10,011	2,660	..	..	..	14,111
Pelandorai do.	1,939	9,242	2,671	— 2	13,850	1,939	9,329	2,607	— 2	..	..	13,873
Lower Coleroon do.	366	21,059	5,007	100	26,532	365	20,401	4,730	129	..	..	25,625
Thadapalli channel	1,500	7,500	2,130	..	11,130	1,500	7,500	2,140	42	..	..	11,182
Arkenkota ,,	596	3,500	947	..	5,043	596	3,501	955	..	..	..	5,052

B.—Statement showing by Systems the Grants for and Expenditure incurred on Irrigation Navigation, and Agricultural Works during 1899-1900—*cont.*

—	Final grants for 1899-1900. Original works.	Repairs.	Establish-ment.	Tools and plant.	Total.	Expenditure incurred in 1899-1900. Original works.	Repairs.	Establish-ment.	Tools and plant.	Refund of revenue.	Less receipts on capital account.	Total.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
PROVINCIAL—*cont.*												
43. Minor Works and Navigation—*cont.*												
Class II.—Minor Works and Navigation for which Capital and Revenue Accounts are kept—cont.												
Revenue Account—*cont.*												
Kalingaroven channel	200	7,800	1,895	..	9,895	200	7,788	1,869	..	..	..	9,857
Nandyar channel	218	5,000	1,210	40	6,468	217	5,000	1,047	37	..	..	6,301
Maradur anicut	620	5,082	1,327	..	7,029	647	5,151	1,190	..	..	..	6,988
Chilka Lake canal	..	488	112	..	600	..	418	96	..	..	..	514
Buckingham ,,	1,238	69,000	26,155	2,000	98,393	1,139	68,797	23,977	1,578	11	..	95,502
Védáranniyam canal	..	2,642	708	100	3,450	..	2,839	777	86	..	..	3,702
Total	38,515	2,42,306	77,289	2,156	3,60,266	38,765	2,40,044	73,942	1,784	26	..	3,54,561
Class IV.—Other Minor Works for which neither Capital nor Revenue nor individual Accounts are kept.												
(a) In charge of the Public Works Department—												
Ordinary works	2,33,099	4,37,071	1,53,258	10,152	8,33,580	2,18,750	4,26,125	1,48,903	9,994	..	..	8,03,772
Old maintenance charges	10,381	1,42,850	2,60,320	1,868	4,15,419	10,381	1,42,850	2,83,084	1,868	..	..	4,38,183
Tank Restoration repairs	..	2,96,260	68,140	4,489	3,68,889	..	2,94,523	67,258	4,431	..	..	3 66,212
(b) In charge of Revenue Department	25,423	20,505	10,562	688	57,178	21,873	20,055	9,633	627	..	..	52,188
Total	2,68,903	8,96,686	4,92,280	17,197	16,75,066	2,51,004	8,83,553	5,08,878	16,920	..	..	16,60,355
Class V.—Agricultural Works	1,22,268	3,72,099	1,14,574	7,794	6,16,735	1,20,194	3,70,777	1,09,648	7,546	115	..	6,08,280
Total, Provincial	7,15,172	15,11,091	7,47,772	28,797	30,02,832	6,83,616	14,94,374	7,54,115	24,153	141	4,029	29,52,370
Local.												
43. *Minor Works and Navigation.*												
Minor Works for which neither Capital nor Revenue Accounts are kept	4,187	3,513	..	..	7,700	4,117	3,508	..	..	..	..	7,625
Provincial.												
33. *Famine Relief.*												
Minor Works and Navigation	..	..	..	..	..	8,718	1,466	54	4	..	..	10,242
Grand Total	12,83,292	22,59,395	14,54,228	1,34,717	51,31,632	12,28,026	22,41,665	14,63,567	1,24,234	530	4,029	50,53,993

Order—No. 613 I., dated 21st July 1900.

The Government is pleased to find from the foregoing note by the Chief Engineer for Irrigation, that the grants provided for expenditure during the past official year have been fully utilized except in a few cases where arrangement should have been made by the Executive Engineers concerned to make timely surrenders of the amounts which could not have been spent.

2. Ordered that a copy of these Proceedings be forwarded to the Government of India for information, with reference to its Circular No. 21 (Public Works), dated 13th December 1882.

[Here enter No. 614 I., 21st July 1900.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ the Chief Engineer for Irrigation, Tank Restoration Scheme.
„ the Chief Engineer, Public Works Department.
„ Superintending Engineers.
„ the Examiner, Public Works Accounts.
„ the Revenue Department.
„ the Financial Department.

Endorsement—No. 614 I., dated 21st July 1900.

Forwarded.

(By order.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

IRRIGATION.

Government {1900} of Madras.

PUBLIC WORKS.

Recd.	1900.	*Enclosures*	
Regd.		*Spare copies*	

G.O., Nos. 621, 622 I., 26th July 1900.

JULY.

Kanigiri Reservoir, Penner River Canals System

Forwarding copy of Proceedings approving the estimate of Rs. 64,300 for improvements to the —, and requesting sanction to the same.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

No. 149 I.

Notes of Inspection by the Chief Engineer for Irrigation.

Kanigiri Reservoir.—The bund of the Kanigiri reservoir was designed to be 9 feet above the full supply and maximum water levels, both of which are 94·45. The front slope was pitched to 3 feet above the same level. The old sections show this revetment 2½ feet thick for some distance from the foot, 1½ feet thick at top and 2 feet in the intermediate portion. It is evident from portions which have subsequently been opened up that the lower part was not made of the thickness designed. The work was also built for the most part of much smaller stone than it would have been desirable to use, no doubt, owing to the difficulty and expense of getting a sufficient quantity of large stone. The tank, when full, has an area of nearly 20 square miles and a capacity of 6,419 millions cubic feet or nearly the same as the Periyár lake above the sill of the water-shed cutting. The bund for about 2 miles in length is much exposed to the action of waves, the fetch in some places being 6 to 7 miles. The feeling that the section of the bund and strength of the revetment were insufficient to afford adequate security against the frightful calamity which would be caused by so large a reservoir breaching and its water sweeping down through the middle of the delta found expression even before the work was completed. The Superintending Engineer (Mr. Rundall) in 1885 advocated the extension of the revetment to the top of the bund, the lowering of the full supply level and the retention at the level to which it had then been built (the same as the sill of the escape or 3½ feet below F.S.L.) of a wall which had been substituted for an earthen bund west of the escape. The reasons given for the recommendation to lower the F.S.L. were that "9 feet is not a sufficient margin between the water and the top of the bank, and it would be difficult to raise the embankment any higher; secondly, because in a tank of this magnitude it is desirable to have a margin between the F.S.L. and M.W.L. to act as flood regulator." The recommendations of the Chief Engineer for Irrigation (approved in G.O., No. 131 I., dated 10th February 1885) were that the revetment should be raised to 6 feet above F.S.L. (or 3 feet below top of bank), that the construction of the bridge and shutters on the weir should be deferred and the wall beyond left at the same level until the earthwork had thoroughly consolidated and the revetment had been raised to 6 feet above ultimate M.W.L. Mr. Rundall had estimated from observations of the discharge over the Duvvur tank weirs in November 1884 that the maximum surplus

from the Kanigiri reservoir which would have to be provided for was 9,550 cubic feet per second. Colonel Hasted directed that careful observations should be made of the effect of rainfall and storms in order that it might be ascertained to what height it would be safe to raise the water and what length of escape would be necessary to prevent the possibility of the tank breaching.

2. In 1890, Mr. Walch, then Chief Engineer for Irrigation, inspected the tank. In his inspection notes printed with G.O., No. 192 I., dated 24th March 1890, he notes that in the cyclone of the previous December (when the level of water was 3 feet below F.S.L.) the water was piled up and the waves ran high in the bay or "pocket" which extends for a considerable distance west of the Southern channel head sluice. The waves did not reach the top of the bank, but spray from them was driven over it in quantities. Mr. Walch laid down the rules which have been followed until the issue of G.O., No. 450 I., dated 13th June 1898, that the reservoir was not to be filled above + 88·0 between 10th October and 15th November and not above + 90 between 15th November and 25th December. It was only after 25th December that it was permitted to fill the reservoir. The effect of these rules was that up to last year only two-thirds of the capacity of the reservoir was really available.

3. The storm of 1889 did considerable damage to the revetment which apparently had not been raised as ordered in 1885. Mr. Walch considered that it would be sufficient to repair the particular places where there had been displacement with better backing and thicker stone. This was accordingly done at a cost of about Rs. 11,000. The next test to which the reservoir was exposed was in November 1893 (see G.O., No. 450 I., dated 13th June 1898). On this occasion the rainfall was 22·1 inches in eight days. The reservoir was low (88·5) when the storm began and during its continuance rose 3 feet corresponding to a run off of 8·8 inches from the catchment, but it appears to have risen another foot before the flow diminished. When the wind was strong it blew from a safe quarter. From the west and north-east it blew fitfully and moderately, but whenever it did so the waves washed up slowly to the top of the revetment. The greatest discharge over the weir was only about 1,700 cubic feet per second. After this it was decided to improve the escapes which now comprise 31 vents of 10 feet with sills 3½ feet below F.S.L. and 27 vents of 7 feet with sills 8½ feet below F.S.L. The top of the revetment is about 4 feet above F.S.L. and the front slope between this and the top of the bund is covered with a thick growth of *kakirellu* reeds which is probably as effective as revetment as long as it keeps thick and is not undermined by waves. The improved conditions admitted of the rules for regulating the height of water in the tank being modified and Government sanctioned (in G.O., No. 450 I., dated 13th June 1898) the retention of water to 17 feet on sluice sill between 10th October and 15th November and 18 feet between 15th November and 25th December. This slight change in the rules was found useful last year when the irrigation season began late and it helped materially to make the water last to the end of the season. It is however only rarely that any supply is received after 25th December, so that we are still working with a virtual capacity of 4,600 instead of the full capacity of 6,400 millions cubic feet and lose a month's supply for the whole land of the delta. This happened last year when the river was in fresh for five weeks during the time the filling of the tank was prohibited.

4. The existing escape is sufficiently powerful to discharge water from the tank as rapidly as it can enter and the tank can thus be always kept below F.S.L., but the drainage channel from the weirs, except for the first 4 miles, is narrow, very irregular and tortuous and fringed with cultivation down to its junction with the Pennér, over 20 miles from the tank. This channel is not capable of carrying even local drainage and during heavy rains the country on either side gets flooded. The greatest quantity which has ever been passed into it from the tank since its construction is 1,700 cubic feet per second or 18 per cent. of the calculated maximum. An estimate of about a lakh has been made for improving this drain below the 4th mile, but the drain is calculated to carry only a fourth of the maximum drainage. The work is held over to provide employment during famine. Even after the improvements are carried out only very limited use can be made of the drain unless on emergencies when the destruction of crops is a minor consideration.

5. To increase the means of disposing of surplus water, Government sanctioned* the construction of a surplus sluice in the north-east margin of the tank with a channel from it to the Pyderu. This work is now in hand. When it is completed we may be able to fill the tank a little higher than at present before the end of the rains, but we shall still be a long way off having things in a satisfactory state. The full area intended to be irrigated cannot be supplied until we can fill the tank to its F.S.L. whenever there is an opportunity of doing so. In my opinion the bund should be raised in the exposed places (viz., for a short distance near the eastern head sluice and for about $1\frac{3}{4}$ miles west of the southern head sluice) to 12 feet above F.S.L., the revetment extended to the top and the top gravelled. A low parapet wall might be added on the top of the revetment. All slopes should be 2 to 1. The top of the bund should slope down from the raised portion at an easy gradient. The roadways over the sluices should be raised as far as the designs will permit and where they cannot be made the same height as the bund, the connections must be strengthened by masonry revetments. An estimate for the improvements noted above should be prepared.

* In G.O., No. 147 I., dated 10th Feb. 1896.

* * * * *

From J. HANNAN, Esq., Superintending Engineer, II Circle, to the Chief Engineer for Irrigation, dated Bezwada, 5th May 1900, No. 32 I.

With reference to G.O., No. 678 I., dated 5th August 1899, communicating inspection notes of the Chief Engineer for Irrigation, I have the honour to forward for your approval and sanction of Government under "Open Capital Account" plans and estimates, amounting to Rs. 53,000, for improvement to Kanigiri reservoir bund in the Nellore division.

2. The report which accompanies the estimate explains the necessity for the work.

ENCLOSURES.

REPORT to accompany the estimate for improvements to Kanigiri reservoir bund, Sangam Anicut System.

	RS.
Amount of estimate	53,000

The estimate was called for in G.O., No. 678 I., dated 5th August 1899. The bund of the reservoir is now about 8 feet above the F.T.L. and is not high enough to hold up F.T.L. during the monsoon months. The existing orders are that the water level in the reservoir should not exceed 17 feet from 10th October to 15th November and 18 feet from 15th November to 25th December. As the river is scarcely in floods after the 25th December, the reservoir can never be filled to its F.T.L. and the available storage is therefore insufficient for the requirements of the delta. If the restriction regarding the storage in the monsoon months be removed, much of the river freshes that are now going waste to the sea can be utilized in filling the reservoir.

2. It is therefore proposed to raise the bund to 12 feet above F.T.L and to revet the front slopes up to the top. The top width of the bund will be 9 feet and side slopes 2 to 1.

A parapet wall, 2 feet × 2 feet, will be built on the top of the front revetment and the top of the bund will be gravelled.

3. The roadway over the sluices is only 4 feet above F.T.L. and the design does not allow of raising it. The bund will therefore be sloped off at a gradient of 1 in 10 to meet this. The top and the rear slope of this sloped portion will be protected with roughstone paving.

4. About 20 acres of land have to be acquired permanently for taking earth, and provision is made for the necessary compensation.

(Signed) R. A. SRINIVASA AIYANGAR,
Executive Engineer.

21st February 1900.

Estimate Form—Abstract—Classified

Sub-head.	Names of works.	Amount of estimate for individual works.	Total of sub-heads.	Total for each canal or distributary.	Total of each main head.
1	2	3	4	5	6
	CAPITAL EXPENDITURE NOT CHARGED TO REVENUE.	RS.	RS.		
	49. IRRIGATION.				
	Penner River Canals System.				
	Sangam Section.				
	Open Capital Account.				
	I. Works.				
	2. Main Canals and Branches.				
	Remunerative Work.				
	Improvements to Kanigiri Reservoir.				
2. Land ..	1. Compensation for land	4,000	4,000		
14. Tanks and reservoirs.	2. Improvements to bund	48,900	48,900		
15. Miscellaneous.	3. Demarcation stones	100	100		
	Total, I. Works	..	53,000		
	II. Establishment ..	..	11,270		
	III. Tools and plant.	..	30		
	Total, Estimate ..	..	64,300	..	..

29th June 1900.

(Signed) R. N. H. REID,
for Chief Engineer for Irrigation.

No. 145 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, II Circle, submits the accompanying estimate, amounting to Rs. 53,000, for the improvements to the Kanigiri reservoir, Pennér river canals system, suggested by the undersigned in paragraph 5 of the inspection notes read above. It is expected that, when improved, as proposed, it would be possible to fill the reservoir to its F.S.L. to enable the full area intended to be irrigated by it, being supplied. The area charged as irrigated during the five years ending with 1898-99 is given in the margin. The ultimate area expected to be irrigated by the reservoir is 90,300 acres. The estimate is recommended for sanction.

—	Area charged as irrigated.		
	1st crop.	2nd crop.	Total.
	ACS.	ACS.	ACS.
1894-95 ..	67,754	3,505	71,259
1895-96 ..	68,633	3,298	71,931
1896-97 ..	67,019	6,298	73,317
1897-98 ..	66,125	3,702	69,827
1898-99 ..	67,986	2,940	70,926

2. The work is classed as "remunerative" and will probably be completed by the 31st March 1903.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

2nd July 1900.

ORDER—No. 621 I., dated 26th July 1900.

The estimate, amounting to Rs. 53,000, or Rs. 64,300 including establishment and tools and plant, for improvements to the Kanigiri reservoir, Pennér river canals system, is approved.

2. Ordered that a copy of these Proceedings be forwarded to the Government of India, together with the estimate and plans for the work, with a request that sanction to the estimate may be accorded at an early date, under "49. Capital expenditure not charged to Revenue," Pennér river canals system.

[Here enter No. 622 I., dated 26th July 1900.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle.
,, Examiner of Public Works Accounts.

ENDORSEMENT—No. 622 I., dated 26th July 1900.

Forwarded.

(By order.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd.	1900.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 624 I., 27th July 1900.

JULY.

Ruined Tank of Upparapalem of Kocherla, Kistna Northern Division

The estimate of Rs. 5,630 for restoring the —, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From M. R. KHAREGAT, Esq., Offg. Executive Engineer, Kistna Northern Division, to the Superintending Engineer, II Circle, dated 5th May 1900, No. 47 S.E./122 W.

I have the honour to submit, herewith, for approval and sanction, an estimate, amounting to Rs. 5,230, for restoring the ruined tank of Upparapalem of Kocherla in the Vinukonda taluk.

2. The Revenue Department has been requested to furnish the information regarding the amount of compensation. As this information has not yet been received, a lump sum provision of Rs. 690 has been made in the estimate to meet the charges. If the tank is restored, a return of about 5 per cent. on capital may be expected.

ENCLOSURE.

Report on Upparapalem Tank of Kocherla.

General description.—This ruined tank is situated at a distance of 7 miles to the north-east of Vinukonda. It is not known when this tank was breached.

The cause of breaching was, doubtless, the nature of soil at site of large breach which is found to be sowdu. This tank appears formerly to have breached at C.S. No. 2, as is evident from the vagu running from the bank at this site. The bank appears then to have been made up very strongly with a top width of 14 feet, and then it would seem that the tank breached at the present site owing to the treacherous nature of the soil.

The works that are required to restore the tank are —

(*a*) Raising and strengthening the bund.
(*b*) Revetment to bund from 2,100 feet to 3,000 feet, the soil for this distance being sowdu.
(*c*) Constructing two sluices.
(*d*) Providing a suitable escape.

As the ayacut is directly under the tank, no distributary is necessary.

The extent of the former ayacut is not known. $3\frac{1}{2}$ acres of the present ayacut is inam, 30 acres poramboke (waste) and $76\frac{1}{2}$ acres patta, which is now being cultivated dry ; of the tank bed, 30 acres has also been given out on patta and is being cultivated dry, the remaining 53 acres is poramboke waste. At C.S. No. 2 in the tank bund a sluice has been placed by the ryots to drain the tank.

Supply.—The tank has a combined catchment area of 6 square miles, of which 3 square miles are free. The total area of irrigable land under the tank is 110 acres, which would be 36·6 acres per square mile of free catchment only ; the supply will be adequate.

Bund.—From 0 to 1,200, the bund consists of gravelly soil, from 1,200 to 2,100 of hard loam, and from 2,100 to 2,800 is sowdu. The bund will be raised to a uniform height of 4 feet above M.W.L., viz., + 46·00, except for a length of 100 feet on either side of sluice sites and at breaches, where the top level of bund will be made 1 foot higher than the rest, viz., + 47·00.

The side slopes of bund will be made $1\frac{1}{2}$ to 1, both front and rear, except at site of sluices, where the rear slope will be made 2 to 1. From 2,100 feet to 3,000 feet the rear slope will also be made 2 to 1 as the soil is sowdu. The earth will be obtained from the tank bed.

There are at present two breaches in the bund :

Breach No. 1.—This is about 80 feet long and 9 feet deep. No difficulty will be experienced here as the soil is hard loam and no scour has been formed, the bank only having been washed away.

Breach No. 2.—This is more serious It is 150 feet long and 18 feet deep. The breach will be closed by removing the top layer of sand, the bank being formed on the loamy soil after digging longitudinal trenches and filling them with puddle as shown in plan.

Revetment.—There is no revetment at present to the tank. It has probably been washed away as a stone here and there can be seen.

It, however, will now be necessary to revet the bund from 2,100 to 3,000, the soil of which is sowdu. The other portion of bund will not require revetment.

Sluice.—There is one old sluice at present in the tank bund. It is simply a rectangular opening with stone packed on each side. This will now be closed and two new sluices constructed, one above and the other below the breach, through which the vagu now flows:—

		ACS.
Sluice No. 1 will irrigate	... ...	85
" " 2 "	... ...	25
	Making a total of ...	110

Hydraulics—Details.—The combined catchment area being 6 square miles and free 3 square miles, we may expect a maximum flood discharge of 1,296 cubic feet per second as shown below:—

Combined catchment area $= 6$ SM $=$ M.
Catchment area of upper tank $= 3$ SM $= m$.
Taking a suitable coefficient of 450 for the catchment area:

$$\text{We have } C = 450\;;\; c = 90.$$

$$e = c\,(M^{\frac{2}{3}}) \quad - cm^{\frac{2}{3}}$$
$$= 450\,(6)^{\frac{2}{3}} \quad - 90\,(3)^{\frac{2}{3}}$$
$$= 450 \times 3{\cdot}3 - 90 \times 2{\cdot}1$$
$$= 1{,}485 \quad - 189 = 1{,}296 \text{ cubic feet per second.}$$

Surplus arrangements.—To dispose of this surplus it is proposed to build a weir, 148 feet long, at the left flank of the tank as per accompanying plan and estimate.

Weir at left flank—

$$D = \tfrac{2}{3}\,ld \times \sqrt{2\,gd} \times c, \quad \text{when } c = {\cdot}58 \text{ for weir.}$$
$$= \tfrac{2}{3} \quad \times l \times 2 \times \sqrt{128} \times {\cdot}58.$$
$$l = \tfrac{3}{4} \quad \times 1{,}296 \times \frac{1}{11{\cdot}3 \times {\cdot}58}$$
$$= \frac{975}{6{\cdot}6} = 148 \text{ feet.}$$

It is proposed to throw up a bund for 600 feet in length to protect the village which is close to the weir.

The bund will be 5 feet above ground level with a top width of 3 feet, side slopes of $1\frac{1}{2}$ to 1. It will be revetted for a length of 150 feet from the weir to a height of 3 feet with 1 foot stone and 6 inches gravel backing.

Waterspread and capacity.—The area of waterspread of tank at F.T.L. + 4,000 is 3,600,000 square feet or 83 acres.

Taking the sill of lowest sluice at + 31·00, the capacity is $3{\cdot}6 \times \frac{9}{3} = 10{\cdot}8$ M cubic feet approximately.

As the rain is fairly well distributed, we may assume that the tank will fill twice giving a total storage capacity of 21·6 M cubic feet; and assuming the storage required for 1 acre is ·2 million cubic feet, there will be a sufficient storage for 108 acres.

Ayacut.—There are 110 acres of land available for cultivation. The soil is loamy and good for cultivation.

Materials.—Morasa stone for building masonry or revetment can be got from the high ground within $\frac{1}{2}$ mile from the tank bund; gravel $\frac{1}{2}$ mile distance. Sand in bed of vagu. Limestone is available in tank bed. Lime must be burnt locally.

No. 88 I.

Forwarded to the Chief Engineer for Irrigation for favour of sanction of Government being obtained to the estimate, amounting to Rs. 5,630, for restoring the ruined tank of Upparapalem of Kocherla, Vinukonda taluk, Kistna Northern division.

(Signed) J. HANNAN,
Supg. Engineer, II Circle.

2nd July 1900.

No. 152 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, II Circle, submits the accompanying estimate, amounting to Rs. 5,630, for restoring the ruined tank of Upparapalem of Kocherla in the Kistna Northern division. The estimate provides for raising and strengthening the bund, and constructing two sluices and a weir. It is reported that, when restored, as proposed, the tank will irrigate 110 acres from which a return of about 5 per cent. is anticipated. The estimate may be sanctioned.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

18th July 1900.

ORDER—No. 624 I., dated 27th July 1900.

The following estimate is sanctioned:—

Provincial.
Irrigation.
43. Minor Works and Navigation.
Class IV—Other Minor Works for which neither Capital nor Revenue nor Individual Accounts are kept.
(*a*) In charge of the Public Works Department.
Original Works.
Kistna Northern Division.
Restoring the ruined tank of Upparapalem of Kocherla.

	RS.
Estimate	5,630

2. This sanction is registered as No. 65 I. of 1900-1901.

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Chief Engineer for Irrigation, Tank Restoration Scheme.
" Superintending Engineer, II Circle,
with eighteen enclosures.
" Examiner of Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government {1900} of Madras.

PUBLIC WORKS.

Recd. } 1900. *Enclosures*

Regd. *Spare copies*

G.O., No. 633 I., 31st July 1900.

JULY.

Funds

Sanctioning certain transfers of — under 42. Major works (Working expenses) and 43. Minor works and Navigation.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

From the Superintending Engineer, I Circle,	dated 22nd May	1900,	No. 652 G.L.
To the Examiner of Public Works Accounts,	„ 30th „	„	„ 147.
From the „ „ „	„ 14th June	„	„ 133 B./A.
From the Superintending Engineer, I Circle,	„ 3rd July	„	„ 1575 G.C.
„ „ „ II „	„ 21st May	„	„ 52 I.
To the Examiner of Public Works Accounts,	„ 25th „	„	„ 145.
From the „ „ „	„ 19th June	„	„ 169 B./A.
From the Superintending Engineer, III Circle,	„ 15th „	„	„ 2239 I.
To the Examiner of Public Works Accounts,	„ 20th „	„	„ 162.
From the „ „ „	„ 29th „	„	„ 302 B./A.
From the Superintending Engineer, III Circle,	„ 14th „	„	„ 2238 I.
To the Examiner of Public Works Accounts,	„ 20th „	„	„ 161.
From the „ „ „	„ 29th „	„	„ 299 B./A.
From the Superintending Engineer, IV Circle,	„ 15th May	„	„ 106 I.
To the Examiner of Public Works Accounts,	„ 19th „	„	„ 142.
From the „ „ „	„ 2nd June	„	„ 18 B./A.
From the Superintending Engineer, V Circle,	„ 22nd May	„	„ 190 E.I.
From the „ „ VI „	„ 21st „	„	„ 848 T.C.
To the Examiner of Public Works Accounts,	„ 28th „	„	„ 146.
From the „ „ „	„ 7th June	„	„ 58 B./A.

No. 154 I.

Note by the Chief Engineer for Irrigation.

The accompanying statement compiled from applications received from Superintending Engineers shows the funds required for incomplete works, and for works sanctioned and not commenced for want of funds. Under "42. Major works (Working expenses)" the total demand, inclusive of establishment and tools and plant charges, amounts to Rs. 67,508, against which the available reserve is only Rs. 28,940. The estimate for five new iron flat boats on which it is proposed to utilize the amount applied for under item 2, being under reference, no funds need be provided for that item. The reserve may be transferred to meet the demand for items 3, 4 and 5 and part of the demand for item 1. The Superintending Engineer, I Circle, should provide the balance of the demand for item 1 from the existing grants at his disposal.

2. Under "49. Capital expenditure not charged to Revenue" there are no funds available at present. Any funds absolutely required to proceed with incomplete or urgent works should be provided by a re-appropriation from the existing grants at the Superintending Engineers' disposal.

3. The total demand under "Provincial—43. Minor Works and Navigation," exclusive of that for "Class IV (*b*)—"Minor works, Revenue Department," amounts to Rs. 1,80,774 * against which the available reserve is Rs. 9,744 * which may be transferred to meet the demand for items 32, 33 and 51 and part of the demand for item 53. In the progress report of the Tinnevelly division for May 1900, the Executive Engineer having remarked that the current year's grant of Rs. 14,500 for the work †—"diverting the right flood bank of the Tâmbraparni river below Srívaikuntam anicut, from $11\frac{1}{4}$ to $12\frac{1}{2}$ miles"—will be surrendered as the work is not required to be done, the Superintending Engineer was, in this office No. VI./21 T.N., dated 9th June 1900, asked to surrender the amount. He may, under this office Circular No. 30 G., dated 27th August 1894, transfer a portion of the above amount to meet the unprovided balance of the demand for item 53 and the demand for item 52, and surrender the balance. The Superintending Engineers concerned should, if urgently required, provide funds applied for for other items shown in the statement by a re-appropriation from the existing grants at their disposal.

* Including establishment and tools and plant charges.

† Sanctioned in G.O., No. 931 I., dated 2nd December 1898.

4. Under "Class IV (*b*)—Minor works, Revenue Department," the total demand is Rs. 21,618,‡ of which Rs. 13,518 ‡ are for incomplete works. The available reserve of Rs. 13,638 ‡ may be transferred to meet the above demand for incomplete works and a part of the demand for item 40. There are no funds available, at present, to meet the balance of the demand.

‡ For works.

5. The Revenue Department may be asked to sanction the additional grant of Rs. 3,450 required under Local Irrigation Cess Fund for expenditure on Original works in the Salem division—item 56.

6. It is observed that some of the items shown in the statement should have been included in the Superintending Engineer's budget estimates.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

16th July 1900.

Enclosure.

Statement of Funds required for 1900–1901, for Incomplete Works of the past year, and for Works sanctioned and not commenced for want of Funds.

Item No.	Division.	Name of work.	Amount of estimate.	Authority.	Outlay to end of 1899–1900.	Balance of estimate.	Amount applied for 1900–1901.	Amount proposed for 1900–1901.	Remarks.
1	2	3	4	5	6	7	8	9	10
			RS.		RS.	RS.	RS.	RS.	
		IMPERIAL.							
		Class I.							
		42. *Major Works—Working Expenses.*							
		Gódávari Delta System.							
1	Gódávari Eastern.	Maintenance and repairs	..	....	..	..	41,423	11,124	The Superintending Engineer reports that the amount applied for is required in addition to budget grant of Rs. 92,577, for repairing Taki and Anaparti drains, the bad condition of which brought about large remissions of revenue in the jamabandi of 1898–99.
		Establishment ..	..	....	..	..	9,527	2,558	
2	Do. ..	Tools and plant	..	....	..	..	1,300	..	It is reported that the amount applied for is required in addition to budget grant, for expenditure on the construction of five new iron flat boats for which an estimate of Rs. 30,700 was submitted with Superintending Engineer's letter, No. 1071 G.E., dated 5th May 1900. The Superintending Engineer has been asked to report how much the provision of the new boats would reduce the freight charges now paid to private boat-owners. This information is still awaited.
		Total, Gódávari Delta System ..	..	....	..	..	52,250	13,682	
		Cauvery Delta System.							
3	Tanjore ..	Maintenance and repairs	..	....	..	..	10,000	10,000	It is reported that this additional grant is absolutely necessary as some of the new works have not yet been put in hand for want of funds.
		Establishment ..	..	....	..	..	2,300	2,300	
		Total, Cauvery Delta System ..	..	....	..	..	12,300	12,300	
		Barur Tank Project.							
4	Salem ..	Extensions and improvements	..	....	..	..	300	300	It is reported that the amount now applied for is required in addition to budget grant.
5	....	Maintenance and repairs	..	....	..	..	2,105	2,105	
		Total ..	..	....	..	..	2,405	2,405	
		Establishment ..	..	....	..	..	553	553	
		Total, Barur Tank Project ..	..	....	..	..	2,958	2,958	
		Total, 42. Major Works (Working Expenses).	..	....	..	..	67,508	28,940	
		49. *Capital expenditure not charged to Revenue.*							
		Gódávari Delta System.							
6	Gódávari Eastern.	Excavating Pasalapudi north side channel— Land compensation .. .. Rs. 1,123; Excavation .. .. „ 677	1,800	G.O., No. 87 I., dated 26th January 1900.	77	1,723	1,723	..	

		Excavating a drain from near Mamidada through Gundredu punts about 21st mile of Cocanada canal.							
7	Gódávari Eastern.	Compensation for land	450	G.O., No. 764 I., dated 6th September 1899.	..	450	450	..	
		Total ..	..		..	..	2,173	..	
		Establishment ..	..		..	..	138	..	
		Total, Gódávari Delta system ..	..		..	..	2,311	..	
		Cauvery Delta System.							
8	Tanjore ..	Constructing a syphon across the Neelathanallur channel for drainage Mangari lands.	1,040	G.O., No. 128 I., dated 7th February 1900.	..	1,040	1,000	..	
9	Do. ..	Fitting the Merattur anicut across the Vettar with some of the iron falling shutters from the Grand anicut.	4,280	G.O., No. 372 I., dated 11th April 1900.	..	4,280	4,200	..	
		Total ..	..		..	..	5,200	..	
		Establishment ..	..		..	..	1,196	..	
		Total, Cauvery Delta System ..	..		..	..	6,396	..	
		Total, 49. Capital expenditure not charged to Revenue	..		..	..	8,707	..	
		PROVINCIAL.							
		43. Minor Works and Navigation.							
		Class II.—Minor Works and Navigation for which Capital and Revenue Accounts are kept.							
		Capital Account.							
		Barur Tank System.							
10	Salem	Lump sum	..	....	..	..	1,800	..	The amount applied for is, it is said, required for incomplete works.
11	North Arcot ..	Constructing an inspection bungalow at Munnel.	3,650	G.O., No. 548 I., dated 20th July 1898.	1,349	2,301	2,300	..	
		Palar Anicut System.							
12	North Arcot ..	Constructing Superintendent's and lascar's quarters at Palar anicut.	2,090	G.O., No. 632 I., dated 26th July 1899.	..	2,090	2,090	..	
13	Do. ..	Constructing Karekantangal kondam ..	1,170	G.O., No. 195 I., dated 20th February 1900.	..	1,170	1,170	..	
14	Do. ..	Constructing masonry works in Nallur tank.	1,150	G.O., No. 112 I., dated 1st February 1900.	..	1,150	1,150	..	
		Nandyar Channel System.							
15	Trichinopoly ..	Improving the Nandyar extension channel..	2,480	G.O., No. 877 I., dated 17th October 1899.	939	1,541	1,541	1,541	
		Total ..	..		..	..	10,051	1,541	
		Establishment ..	..		..	..	2,312	354	
		Total, Capital Account ..	..		..	..	12,363	1,895	

Statement of Funds required for 1900–1901, for Incomplete Works of the past year, and for Works sanctioned, and not commenced for want of Funds—*cont.*

Item No.	Division.	Name of work.	Amount of estimate.	Authority.	Outlay to end of 1899–1900.	Balance of estimate.	Amount applied for 1900–1901.	Amount proposed for 1900–1901.	Remarks.
1	2	3	4	5	6	7	8	9	10
		Revenue Account.	RS.		RS.	RS.	RS.	RS.	
		Pálár Aniont System.							
16	North Arcot ..	Extensions and improvements	8,500	....	976	7,524	7,524	..	Of the amount applied for, Rs. 2,334 are for three incomplete works, the balance being for works not yet commenced.
17	Do. ..	Maintenance and repairs, Poiney aniout system.	9,050	....	954	8,096	8,096	..	The amount applied for is for two incomplete works.
18	Do. ..	Extensions and improvements	300	....	..	300	300	..	Do. do.
19	Do. ..	Maintenance and repairs	3,310	....	..	3,310	3,310	..	Do. do.
		Total ..	..		..	..	19,230	..	
		Establishment ..	..		..	..	4,423	..	
		Total, Revenue Account ..	..		..	..	23,653	..	
		Class IV.							
		Other Minor Works for which neither Capital nor Revenue nor Individual Accounts are kept.							
		(a) In charge of Public Works Department.							
		Ordinary Works.							
		Original works estimated to cost Rs. 2,500 or more each.							
20	Vizagapatam ..	Improvements to Kurmasagara tank ..	3,030	G.O., No. 267 I., dated 25th March 1898.	2,461	869	869	..	
21	Kistna Northern.	Ipur tank scheme	41,220	G.O., No. 293 I., dated 22nd March 1900.	36,453	4,767	4,767	..	
22	....	Jonapad tank scheme	26,630	G.O., No. 148 I., dated 16th February 1895.	26,090	540	2,810	..	It is reported that a revised estimate for this work is under check in the Divisional office.
23	Nellore ..	Investigation of Mopad reservoir project ..	3,000	G.O., No. 18 I., dated 15th January 1900.	599	2,401	2,400	..	
24	Do. ..	Examining the bed of Paleru at Paletipalli.	5,700	G.O., No. 166 I., dated 10th February 1900.	..	5,700	5,600	..	
25	Do. ..	Gudipattipalli Sivayya and Timmareddipalli Venkamma tanks.	1,850 1,231	....	605	2,476	2,476	..	
26	Bellary ..	Excavating a new channel from the Roya channel, 12th mile.	6,600	G.O., No. 963 I., dated 11th November 1899.	4,182	2,418	2,418	..	

27	Bellary ..	Improving the head of the supply channel from the Penner river to Hindupur tank.	3,890	G.O., No. 1024 I., dated 2nd December 1896.	2,823	1,067	1,067	..	
28	Do. ..	Improving the Kamumukkula Yerracheruvu tank with its supply channel and head work.	6,780	G.O., No. 592 I., dated 27th June 1897.	4,440	2,340	2,000	..	
29	Do. ..	Excavating the Hussainpuram channel ..	9,000	G.O., No. 773 I., dated 6th October 1898.	8,864	626	626	..	
30	Cuddapah ..	Improvements to Hastinapuram tank ..	4,800	....	3,889	911	911	..	
31	West Coast ..	Improvements to the Conolly's canal, Calicut.	4,210	G.O., No. 714 I., dated 17th August 1899.	500	3,740	3,740	..	
32	Trichinopoly ..	Reconstructing the Chintamani odai weir on the right bank of the Ponneri channel.	7,220	G.O., No. 309 I., dated 25th March 1899.	3,000	4,220	4,220	4,220	
33	Do. ..	Improving Kothamangalam Periakolam ..	4,060	G.O., No. 99 I., dated 25th November 1896.	3,560	500	500	500	
34	Salem ..	Original works estimated to cost less than Rs. 2,500 each.	..	....	..	..	3,300	..	Required in addition to budget grant.
		Total ..	..	....	..	..	37,704	4,720	
		Establishment ..	..	....	..	..	8,672	..	
		Tools and plant ..	..	....	..	..	566	..	
		Total, Ordinary ..	..			..	46,942	..	
		(*b*) In charge of the Revenue Department.							
35	Vizagapatam ..	Original works	..	....	..	..	1,250	750	Of the amount shown in column 8 only Rs. 750 are for incomplete works.
36	Gódávari Eastern.	Do.	..	....	..	..	2,770	770	Of the amount applied for, Rs. 770 are for incomplete works.
37	Gódávari Western.	Do.	..	....	..	..	1,000	1,000	Required for incomplete works.
38	Bellary ..	Do.	..	....	..	..	338	338	Do. do.
39	North Arcot ..	Do.	..	....	..	..	130	130	Do. do.
40	Salem ..	Do.	..	....	..	..	700	120	....
41	Trichinopoly ..	Do.	..	....	..	..	840	840	Required for incomplete works.
		Total ..	..		..	..	7,028	3,948	
42	Vizagapatam ..	Repairs	..	....	..	..	35	35	Required for an incomplete work.
43	Gódávari Eastern	Do.	..	....	..	..	1,996	596	Of the amount applied for, Rs. 596 are for incomplete works.
44	Gódávari Western.	Do.	..	....	..	..	200	..	Required for an uncommenced work.
							3,300	..	Do. do.
45	Bellary ..	Do.	..	....	..	..	7,139	7,139	Required for four incomplete works.
46	Kurnool ..	Do.	..	....	..	..	1,810	1,810	Required for two incomplete works.
47	North Arcot ..	Do.	..	....	..	..	110	110	Required for an incomplete work.
48	Trichinopoly ..	Do.	..	....	..	..			
		Total ..	..		..	..	14,595	9,690	
		Total, Original Works and Repairs ..	..	....	..	..	21,618	13,638	
		Establishment ..	..	....	..	..	4,972	3,137	
		Tools and plant ..	..	....	..	..	324	205	
		Total ..	..		..	..	26,914	16,980	
		Tank Restoration Works.							
49	Kurnool ..	Repairs	..	....	..	..	13,537	..	Of the amount, viz., Rs. 13,537, applied for, Rs. 8,627 are for incomplete works.
		Establishment ..	..	....	..	..	3,114	..	
		Tools and plant ..	..	....	..	..	203	..	
		Total ..	..		..	..	16,854	..	

Statement of Funds required for 1900–1901, for Incomplete Works of the past year, and for Works sanctioned and not commenced for want of Funds—*cont.*

Item No.	Division.	Name of work.	Amount of estimate.	Authority.	Outlay to end of 1899–1900.	Balance of estimate.	Amount applied for 1900–1901.	Amount proposed for 1900–1901.	Remarks.
1	2	3	4	5	6	7	8	9	10
			RS.		RS.	RS.	RS.	RS.	
		CLASS V.							
		Agricultural Works.							
		Works estimated to cost Rs. 2,500 or more each.							
50	Ganjám ..	Improving the drainage channel of the Dandulakshmipuram swamp.	8.870	G.O., No. 741 I., dated 31st August 1899.	3,885	4,985	4,900	..	
51	Tinnevelly ..	Raising and strengthening the Tambraparni river left flood bank above the Srivaikuntam anikut.	6,700	G.O., No. 262 I., dated 24th March 1898.	5,668	1,030	1,030	1,030	
52	Do. ..	Constructing the stone groynes in the Tambraparni river right flood bank below the Srivaikuntam anicut at Authur.	30,200	G.O., No. 474 I., dated 9th June 1899.	25,995	4,205	2,180	..	It is reported that this amount is required in addition to the budget grant of Rs. 2,020.
53	Do. ..	Constructing bridge across the North Main channel of the Srívaikuntam anicut system.	6,570	G.O., No. 707 I., dated 16th August 1899.	1,650	4,920	4,920	554	
54	Cuddapah ..	Original works estimated to cost less than Rs. 2,500.	..	....	..	..	2,000	..	
		Repairs.							
55	Tanjore ..	Lump sum	..	....	..	..	50,000	..	Required in addition to budget grant for repairs to river banks which are reported to be in an exceedingly bad order.
		Total, Agricultural Works ..	..	....	..	..	65,030	1,584	
		Establishment ..	..	....	..	..	14,957	364	
		Tools and plant ..	..	....	.	..	975	24	
		Total ..	..	....	..	..	80,962	1,972	
		Total, Provincial ..	..	....	..	..	2,07,688	..	
		LOCAL.							
		43. *Minor Works and Navigation.*							
56	Salem	Original works	..	....	..	..	3,450	..	Required in addition to budget grant.

Order—No. 633 I., dated 31st July 1900.

The following transfers of funds are sanctioned :—

Imperial.
Irrigation.
42. Major Works (Working Expenses).

From

	RS.
Reserve—	
Maintenance and repairs	23,529
Establishment	5,411
Total ...	28,940

To

	RS.	RS.
Gódávari Delta System. Gódávari Eastern Division.		
Maintenance and repairs ...	11,124	
Establishment	2,558	
		13,682
Cauvery Delta System. Tanjore Division.		
Maintenance and repairs ...	10,000	
Establishment	2,300	
		12,300
Barur Tank Project.		
Extensions and improvements.	300	
Maintenance and repairs ...	2,105	
	2,405	
Establishment ...	553	
		2,958
Total ...		28,940

Provincial.
Irrigation.
43. Minor Works and Navigation.

From

Class IV—Other Minor Works for which neither Capital nor Revenue nor Individual accounts are kept
(*a*) In charge of the Public Works Department.
Ordinary Works.

	RS.
Reserve—	
Original works	7,827
Establishment	714
Tools and plant	46
Total ...	8,587

To

Class II—Minor Works and Navigation for which Capital and Revenue Accounts are kept. Nandyar Channel System. Capital Account.		
I. Works	1,541	
II. Establishment	354	
		1,895
Class IV—Other Minor Works for which neither Capital nor Revenue nor Individual accounts are kept. (*a*) In charge of the Public Works Department. Ordinary Works. Trichinopoly Division. Original Works.		
Reconstructing the Chintamany odai weir on the right bank of the Ponneri channel ...	4,220	
Improving Kothamangalam Periyakulam	500	
		4,720
Class V—Agricultural Works. Tinnevelly Division.		
Original Works—		
Raising and strengthening the Támbraparni river left flood bank above the Srívaikuntam anicut	1,030	
Constructing bridge across the north main channel of the Srívaikuntam anicut system.	554	
		1,584
Establishment		364
Tools and plant		24
		1,972
Total		8,587

Class IV(*b*)—Minor Works, Revenue Department.

From	RS.	*To*	RS.	RS.
Reserve—		Vizagapatam Division		
Original works	13,638	Original works	750	
		Repairs	35	
				785
		Gódávari Eastern Division.		
		Original works	770	
		Repairs	596	
				1,366
		Gódávari Western Division.		
		Original works		1,000
		Bellary Division.		
		Original works		338
		Kurnool Division.		
		Repairs		7,139
		North Arcot Division.		
		Original works	130	
		Repairs	1,810	
				1,940
		Salem Division.		
		Original works		120
		Trichinopoly Division.		
		Original works	840	
		Repairs	110	
				950
Total ...	13,638	Total ...		13,638

2. The application for an additional allotment under "Local Irrigation Cess Fund" will be considered in the Revenue Department.

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineers of Circles.
„ the Examiner of Public Works Accounts.
„ the Revenue Department.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

TABULAR STATEMENT OF MISCELLANEOUS PROCEEDINGS AND MATTERS OF ROUTINE,

IRRIGATION,

FOR THE MONTH OF JULY 1900.

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Objectionable Items.—Orders on the statement of — in the accounts of Executive Engineers remaining unremedied to end of March 1900, I Circle.	6th July 1900, No. 579 I.	18th May 1900, No. 466 I. 9th April 1900, No. 358 I.
Land.—Notification for the acquisition of — required for the extension of the bed of the Konada tank, Sarvasiddhi taluk, Vizagapatam district, ordered to be published in the *Fort St. George Gazette.*	6th do. do. No. 580 I.	......
Land.—Notification for the acquisition of — required for the diversion of the Bank canal, Rámachendrapur taluk, Gódávari district, ordered to be published in the *Fort St. George Gazette.*	7th do. do. No. 582 I.	......
Establishment.—The maintenance, during 1900–1901, of the Water Regulation — employed at the Annamarasanar, Negapatam division, sanctioned.	7th do. do. No. 583 I.	......
Lands.—Proceedings, Local and Municipal Department, sanctioning the proposal of the Gódávari District Board to transfer to the Public Works Department certain — required for the Pasumella channel project, subject to certain conditions, communicated to the Superintending Engineer, I Circle.	9th do. do. No. 584 I.	......
Canal requirements.—Telegram from the Director-General of Telegraphs, requesting to be informed as to the — of the Presidency as regards telegraph lines, for 1901–1902, recorded.	9th do. do. No. 585 I.	......
Land.—Notification for the acquisition of — required for providing a gravelled cattle ramp, Bank canal, Amalápur taluk, Gódávari district, ordered to be published in the *Fort St. George Gazette.*	10th do. do. No. 587 I.	......
Land.—Notification for the acquisition of — required for the construction of a new tank at Lingala, Pulivendla taluk, Cuddapah district, ordered to be published in the *Fort St. George Gazette.*	10th do. do. No. 588 I.	......
Land.—Notification for the acquisition of — required for constructing a sluice at head of the Potavaram channel, Amalápur taluk, Gódávari district, ordered to be published in the *Fort St. George Gazette.*	10th do. do. No. 589 I.	......

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Funds.—Authorizing the Examiner of Public Works Accounts to pass the excess over appropriation under 42. Revenue Account and 43. Agricultural Works in the Kistna Western division during 1899–1900, the official year having expired.	13th July 1900, No. 595 I.	......
Land.—Notification for the acquisition of — required for improvements to the Yarabadu Sub-branch, Chicacole taluk, Ganjám district, ordered to be published in the *Fort St. George Gazette.*	16th do. do. No. 600 I.	......
Land.—Notification for the acquisition of — required for repairing the Chunchula canal, Amalápuram taluk, Gódávari district, ordered to be published in the *Fort St. George Gazette.*	16th do. do. No. 601 I.	......
Memorials.—Informing certain petitioners in the South Arcot division that the Collector and Superintending Engineer approve of the cut through the Vyur lands as the best means of straightening the course of the Old Coleroon, and declining to interfere in the matter any further.	16th do. do. No. 602 I.	......
Channels in the Cuddapah District.—Resanctioning under "33. Famine Relief" the estimates for the work of excavating certain —.	16th do. do. No. 603 I.	......
Land.—Notification for the acquisition of — required for excavating and banking the Muniyeru main channel, Nandigáma taluk, Kistna district, ordered to be published in the *Fort St. George Gazette.*	17th do. do. No. 604 I.	......
Funds.—Sanctioning certain transfer of — under "43. Minor Works and Navigation," III Circle.	19th do. do. No. 605 I.	......
Special Deputy Collector, Kurnool Cuddapah canal.—Letter from the Government of India stating that the Secretary of State has confirmed the sanction accorded by that Government to the deputation, for a further period of one year, of the —, communicated to the officers concerned.	19th do. do. No. 606 I.	......
Minor Irrigation Works.—Proceedings, Board of Revenue (Settlement Revenue) submitting report on the expenditure on the upkeep of — during 1899–1900, recorded.	19th do. do. No. 607 I.	7th Mar. 1900, No. 239 I. 19th Dec 1899, No. 1080 I. 26th Feb. 1900, No. 204 I.
European Stores.—The local purchase of the stencil plates required for the office of the Chief Engineer for Irrigation, sanctioned.	21st do. do. No. 615 I.	......
Land.—Notification for the acquisition of — required for the excavation of Balarampore and Satupandiya channels, Berhampur taluk, Ganjám district, ordered to be published in the *Fort St. George Gazette.*	21st do. do. No. 616 I.	......
Land.—Notification for the acquisition of — required for cutting a channel in the Chidambaram taluk, South Arcot district, ordered to be published in the *Fort St. George Gazette.*	21st do. do. No. 617 I.	......

Subjects.	Number and Date of Order.	Numbers and Dates of previous Orders.
Land.—Notification for the acquisition of — required for widening the Valathur channel, Gudiyáttam taluk, North Arcot district, ordered to be published in the *Fort St. George Gazette.*	21st July 1900, No. 618 I.	......
Famine Works.—Re-sanctioning the estimates for certain works in the Cuddapah division, under "33. Famine Relief."	21st do. do. No. 619 I.	22nd Mar. 1900, No. $\frac{298}{A}$ I. 18th Jan. 1900, No. 50 I. 15th Mar. 1900, No. 264 I.
Erratum.—Issuing an — to a notification already published, regarding the acquisition of lands in the Allaparru, Tenali taluk, Kistna district.	24th do. do. No. 620 I.	......
Uniform for Steamer Syrang and crew, Gódávari Eastern Division.—The estimate of Rs. 114 for the supply of —, sanctioned.	27th do. do. No. 623 I.	......
Erratum.—Proceedings, Financial Department, issuing an — to the Government Order accepting the budget estimate of charges under the Irrigation Cess Fund for 1900–1901, communicated to the officers concerned.	30th do. do. No. 625 I.	19th Dec. 1899, No. 1078 I.
Land.—Notification for the acquisition of — required for repairing the Naguilanka crossing, Gannavaram channel, Narsapur taluk, Gódávari district, ordered to be published in the *Fort St. George Gazette.*	30th do. do. No. 626 I.	......
Ferry ballacuts.—The estimate of Rs. 2,055 for constructing three 1st-class iron — in the Gódávari Eastern division, sanctioned.	30th do. do. No. 627 I.	......
Land.—Notification for the acquisition of — required for depositing silt on the left bank of the Polrazu canal, Gudiváda taluk, Kistna district, ordered to be published in the *Fort St. George Gazette.*	30th do. do. No. 628 I.	......
Land.—Notification for the acquisition of — required for the excavation of the new Kamarazu channel, Sarvasiddhi taluk, Vizagapatam district, ordered to be published in the *Fort St. George Gazette.*	30th do. do. No. 629 I.	......
Land.—Notification for the acquisition of — required for excavating the Kalidindi right side channel, Gudiváda taluk, Kistna district, ordered to be published in the *Fort St. George Gazette.*	31st do. do. No. 630 I.	......
Land.—Notification for the acquisition of — required for excavating the left side channel of the Gudiváda channel, Kistna district, ordered to be published in the *Fort St. George Gazette.*	31st do. do. No. 631 I.	......
Tungabhadra river.—Proceedings, Revenue Department, ordering that the Honourable the Resident at Hyderabad, be addressed to move His Highness the Nizam's Government to issue strict instructions to their officers not to interfere with the supply of water in the — without consulting the Public Works officers on the British side of the river, communicated to the Superintending Engineer, III Circle.	31st do. do. No. 632 I.	......